SYSTEM

&

INSTALLATION MANUAL

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1 Welcome

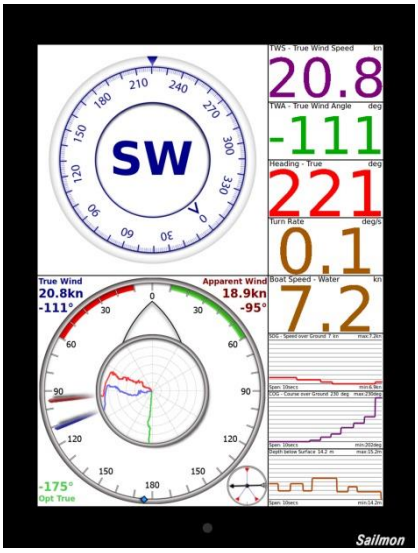
Welcome to Sailmon!

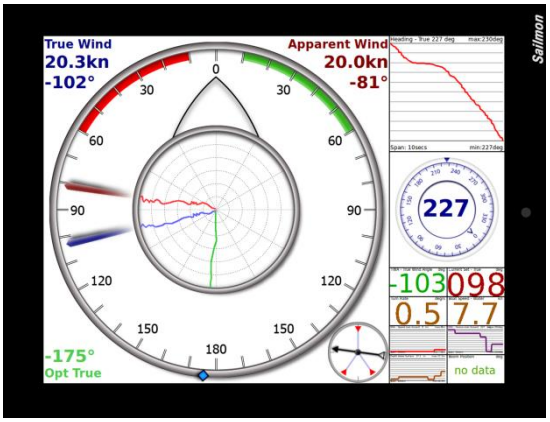
Built for yachts starting from 30ft up to Superyachts, these instruments will definitely add extraordinary power and design to your yacht.

Sailmon combines latest technology with years of experience and hard work. We want to provide an instrument system which is completely flexible. It is neither limited to any sensor manufacturer, nor to any other instrument system. A lot of effort has been made to allow seamless integration to almost all marine electronics.

Finally a team of sailors, engineers, physicians and producers has created a new level of marine instrumentation. Thousands of hours working labor together with a huge enthusiasm in sailing will be part of every single Sailmon device leaving our factory!

2 System overview





The heart of a Sailmon instrument system is the MM104. MM104 means “Marine monitor” 10.4”. The device is a combination of a sunlight visible monitor and a complete race and tactical computer. It offers extraordinary visibility in combination with perfect data. Endless features make this device a leader in instrumentation technology.

The device can be operated in either portrait or landscape mode, depending on the actual size and requirements of the yacht. It can either be used as a cockpit instrument, or as a mast display.

The instrument has a number of data available, including all functions necessary for professional racing yachts. It can be calibrated according the highest level of technology.

The screen layout can be flexibly set by the user. The MM104 is split into different sections according to the preferred layout, and each section can be freely configured as wind instrument, compass, data value, 2D graph, video file or live video.

The MM104 instrument allows a new concept of data representation. With standard instruments you have a display where you can switch between the data you want to be displayed. You actually have to press some buttons to see the data you want to have.

Sailmon uses a new concept here. The idea is that you have ALL necessary data on one screen at one time, and usually never change a single item. All numbers can have different colors, and since you have the possibility to show so many numbers on one screen, you most likely will never change the instrument setup. During setup, the Sailmon instruments can be freely configured, and any value can be displayed on the display, you can create your own instrument style!

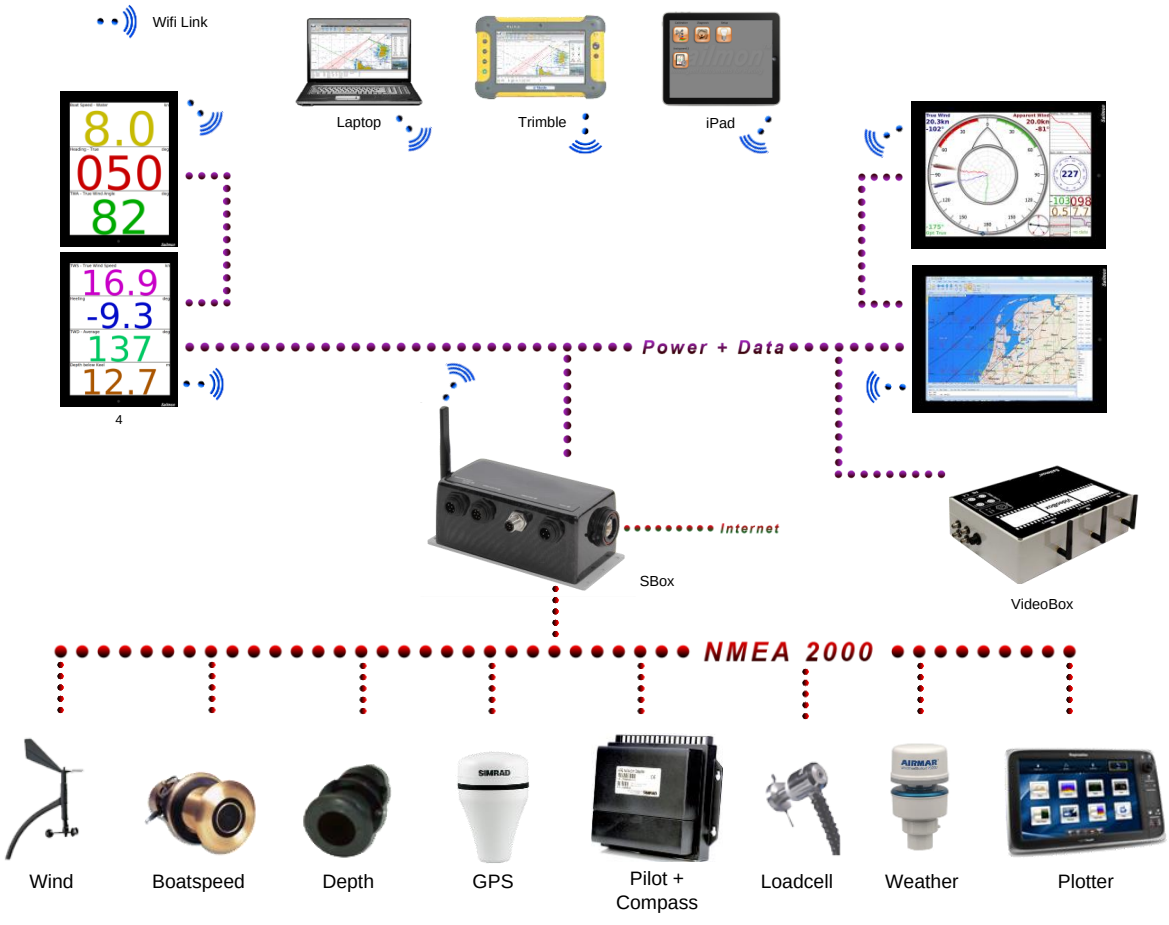
If you want to change data quickly, you can use presets. Preset means that you create a whole display with your layout and your data. Then, you can change between these preset randomly.

For example, you can have one preset for sailing, and one if you are moored to show video on the instruments. Presets can be switched with PC, iPad, or iPod touch.

The MM104 itself is a very rugged device; it comes with a genuine carbon fiber housing and is completely sealed and waterproof.

Due to the unique powerline data transmission, where power and data are sent over the same wires, the installation effort is reduced to a minimum and the instruments have very high reliability.

Take your time to read the manual to get an idea of all the features it offers, and we're sure you will enjoy having the "Sailmons" on board!



Picture 1: Sailmon system overview

A Sailmon mast system typically consists of one or more MM104 Instruments, one SBox Wi-Fi, sensors and iPad / iPod or PC. Direct control and operation is possible over Apple iPad and Android devices. A standard board PC or Laptop is used for a one-time configuration of the system and calibration, but it is **not necessary for operating the system**.

All Sensors are connected to the SBox over the various interfaces. Usually this will be NMEA2000, but NMEA0183, Raymarine SeaTalk, B&G Fastnet and Nexus FDX are fully supported as well. The communication between the Sailmon instruments is done over the very powerful Sailmon network. This is a very innovative

bus which transfers the data over the 2 wires of the power supply with extraordinary speed and very low latency(200 Mbit/s). No data cables and further connectors are necessary, making the instruments very reliable at all conditions.
All MM104LP instruments and the Sbox include high power WiFi transmitters with roaming support. This means you can work with the Sailmon instruments over the wireless iPad, iPod touch,PC or Android devices whenever you are near to any of the instruments. If you connect the SBox to your on-board internet you can even use the Sailmon instruments as internet distribution system on your yacht. (Especially powerful on superyachts)

Interface	Option 1	Option 2	Option 3	Option 4
Port 1	NMEA0183 IN	SEATALK	Nexus FDX	NMEA0183-HS
Port 2	NMEA0183 IN	B&G Fastnet	NMEA0183-HS	
Port 3	NMEA2000			

Table 1: SBox LP interface options

INTEGRATION INTO EXISTING INSTRUMENT SYSTEMS

Sailmon can perfectly be integrated into existing instrument systems or can be used as an add-on to well-known instruments. In any case, it is a direct connection to the other manufacturer's network. For example, Sailmon can directly read B&G Fastnet bus data or Nexus FDX bus data. The advantage of a direct connection is that the user has all values at full update rates available.

Sailmon has made huge effort to allow a seamless integration to almost all common instruments. These include:

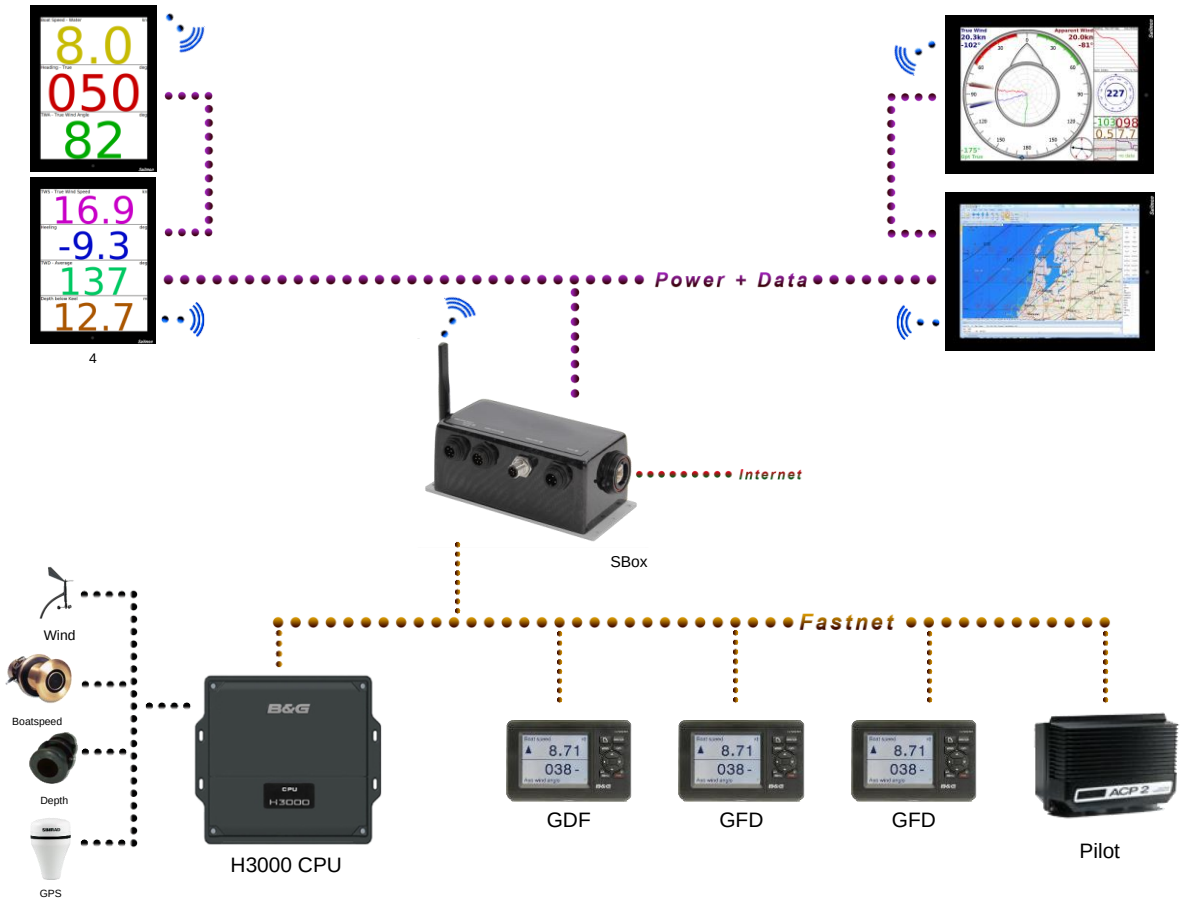
- B&G H3000
- B&G WTPx
- B&G H2000
- Nexus FDX
- Raymarine ST60 systems (SeaTalk)
- Raymarine ST70 systems (SeaTalk NG)
- Raymarine I Series (SeaTalk NG)
- Simrad Networks (Simnet)
- Garmin Networks (NMEA2000)
- All NMEA2000 and NMEA0183 based instruments

In general all NMEA2000 compatible instruments and instrument systems can be connected. For older or non-standard instruments NMEA0183 is available as well. A NMEA0183-HS option allows connection of devices using 38400baud NMEA speed.

Please note that Sailmon is an add-on in this case. For example, you can make a full race system out of your Raymarine system by adding Sailmon.

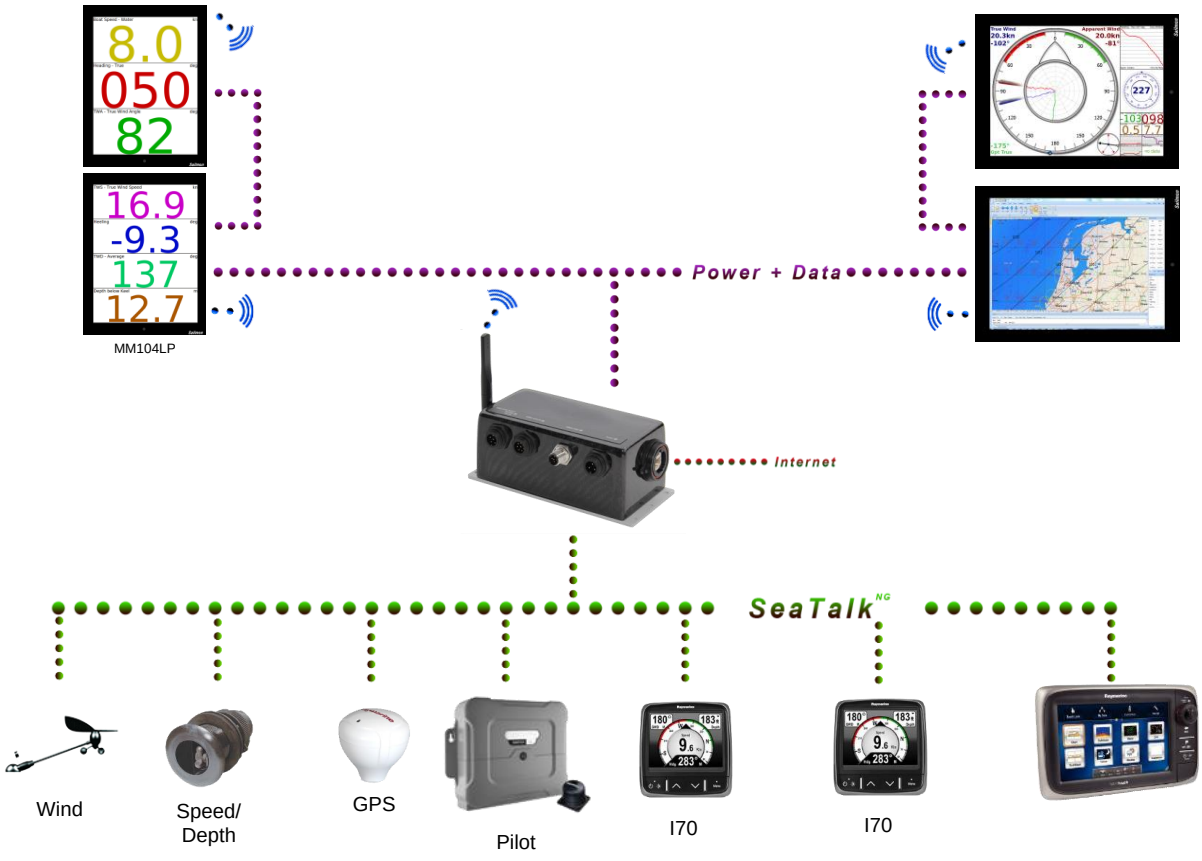
Or, you get very fancy displays for your B&G instruments.

The options are very much unlimited!



Picture 2: Integration to a B&G system

Integration to B&G is a straightforward process. Simply connect the SBox to the B&G Fastnet bus and all B&G data are available at full update rate on your Sailmons. You even have the possibility to take the raw B&G values and further use them for the advanced Sailmon calibration! In this configuration you have the choice which instrumtent system does the calculations and calibration!
Connection is possible to H2000, H3000 and WTPx systems.



Picture 3: Integration to a Raymarine system

Adding Sailmon instruments to Raymarine adds full race power to your yacht. Take advantage of Sailmons high quality data and full calibration options. For professional users it is even possible to change the wind sensor to a B&G 213 type with the Sailmon WindBox.

TYPICAL INTRUMENT SYSTEMS

EXAMPLE 1: INSTALLATION ON A SALONA34, CRUISING AND OCCASIONAL RAGING

In this example the owner uses the boat mainly for cruising, but takes part on regattas a few times per year. Battery capacity is limited due to the relatively small size of the boat. The space between the boom and the boom – vang is not too big, so the preferred option here is to install a single MM104 instrument in portrait mode on the mast. Plenty of space is still available for the ropes then.The shipyard already installs a standard Raymarine instrumentation on the Yacht.

In this case, the actual installation will be very simple. The only parts necessary are the Sailmon SBox Wifi, which directly connects to the Raymarine network, and a MM104 instrument together with a mast bracket.

A single power cable to the mast is sufficient for the mast instrument. Both the SBox and the MM104 instrument are connected to the 12V switching panel, that's all. The complete Sailmon system will draw about 1.4 Amps all together (at full brighness, much less during the night).

All Sailmon features are available immediately, including race functions, iPad/iPod control and tactical software support.

The owner also likes the fact that the instrument data can be sent over wifi to his laptop. His navigation laptop does not need any cable connections any more. He enjoys the brilliant display with extraordinary visibility, even under difficult light conditions. For the races, the owner also has an ORC certificate and therefore has access to the ORC speedguide files for his boat. (This files can directly be imported to Sailmon) So, Sailmon can calculate the polars of the Salona34, including target speeds and angles etc. While moored the owner enjoys the possibility to show videos on the instrument, which is definitely an eyecatcher.

Options: Different levels of sensor quality can be choosen here. If the owner decides for a better wind sensor or ultrasonic boatspeed, the Sailmon system can take full advantage and provide more accurate data.

Conclusion: Adding Sailmon instruments to a Salona 34 adds full race power to this yacht. A huge advantage is given with the high quality data and full calibration options. You will be astounded about the data quality you can get out of even this simple configuration.

EXAMPLE 2: CLASS 40 PROFESSIONAL RACER

In this example, the owner has a Class 40 for professional racing. He takes part in races mainly in the Mediterranean and Caribbean. The yacht has top equipment and the crew has high demands to all parts, including the instruments. For long distance races and transfers, a backup system is strongly required.

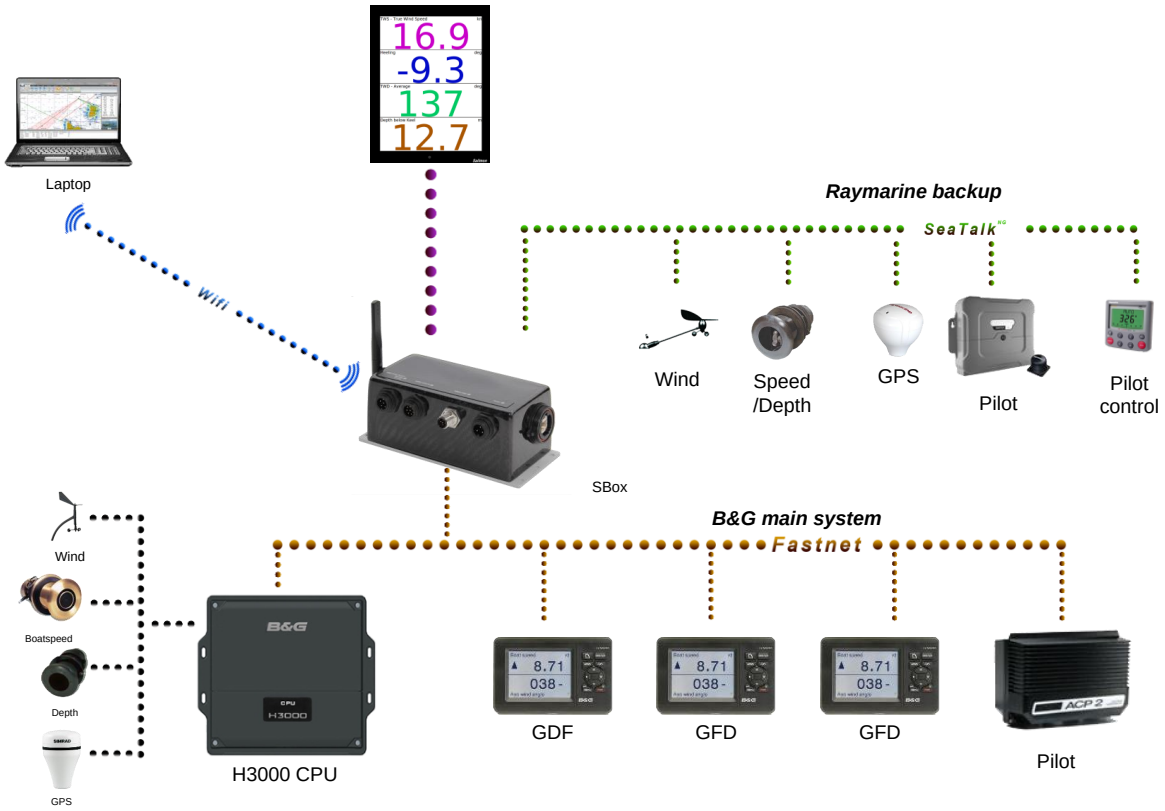
Therefore, a standard B&G H3000 system is installed already as well as a small Raymarine backup pilot.

The boat has state of the art navigation and tactical software on board which is excessively used. The space between the boom and the boom-vang is very limited due to the Class 40 design concept.

In this case Sailmon can provide 2 huge advantages. First, Sailmon can be used as a backup in case the B&G fails. Second, during day and night, especially on long distance races, the Sailmon will provide the ultimate quality of display readability, and it will never blind in the night due to the huge dimming ratio of the Sailmon MM104.

Calibration is done with the B&G system since the owner is used to it already, but can easily switched over to Sailmon if required. Data are wirelessly read by the tactical software. Polar calculations are performed with the Sailmons due to the simple management of your VPP data and the ultimate performance of the 3D polar interpolators.

When moored, the videos of the yacht's sponsors will be displayed to provide benefit for the sponsor. A bright monitor on the mast, with sponsor videos, will not be overseen by people around. The Sailmon instrument itself is installed below the boom, on deck, with a custom made bracket. Mast mounting is not possible due to the limited space. Even if installed in this very exposed place, the Sailmon instrument can be operated reliably since the instrument is completely sealed and waterproof.



Conclusion: Adding Sailmon to this professional long distance racer adds the possibility to have a perfectly readable display, very accurate performance data and a professional backup system.

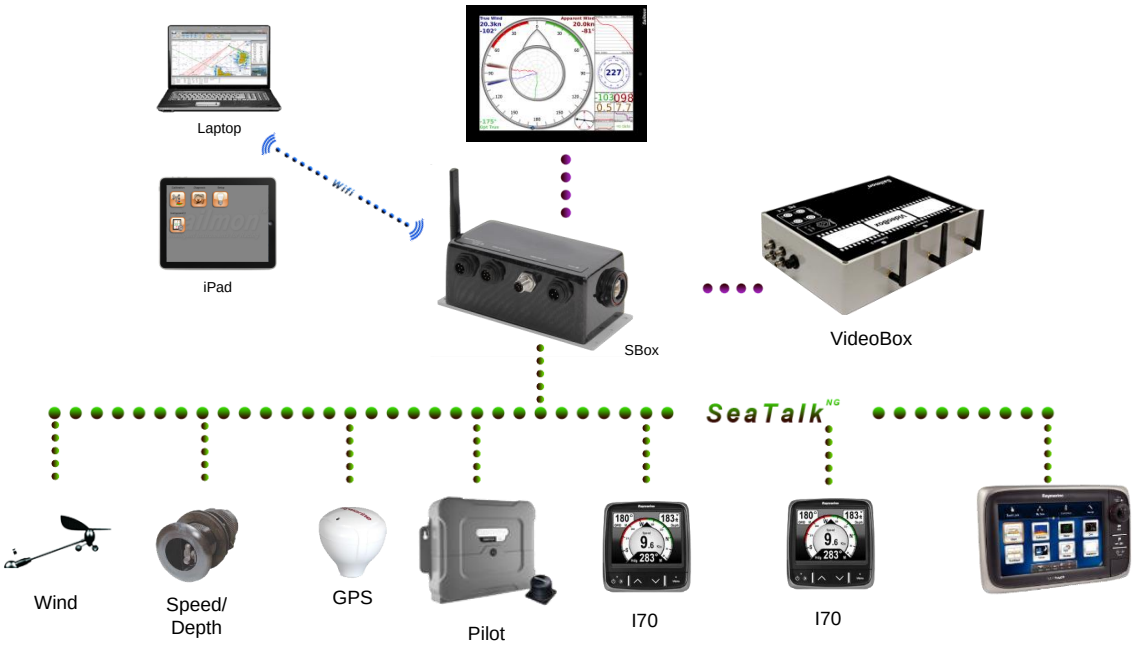
EXAMPLE 3: OUTREMER 49 CATAMARAN

In this example, the owner has a brand new Outremer 49 performance catamaran. The owner likes touchscreen plotters and trusts Raymarine to be the best choice for his instrumentation. However, the yacht is a high performance design, and the owner occasionally wants to take part in races. The main concern is the readability of the relatively small Raymarine instruments while crew is on the after deck. In addition, the owner wants to watch TV outside the saloon in the evening.

In this case, the Sailmon MM104 is kind of a tailor-made solution. It perfectly integrates to the basic Raymarine instruments, while adding performance functions and extraordinary visibility on the after deck.

The graphical elements of the Sailmon, like the wind instrument, are perfect for the crew. And, together with the Sailmon Video-Box, the owner can display TV on the Sailmon! (It is even possible to watch TV and keep your data on a single instrument by dividing the screen area during navigation) Since up to 4 video channels can be connected to the video box, TV and cameras are easily setup to be displayed on the Sailmon MM104.

The owner also likes the fact that the Sailmon can be operated over the iPod and iPad to play around, show videos or configure the instrument.

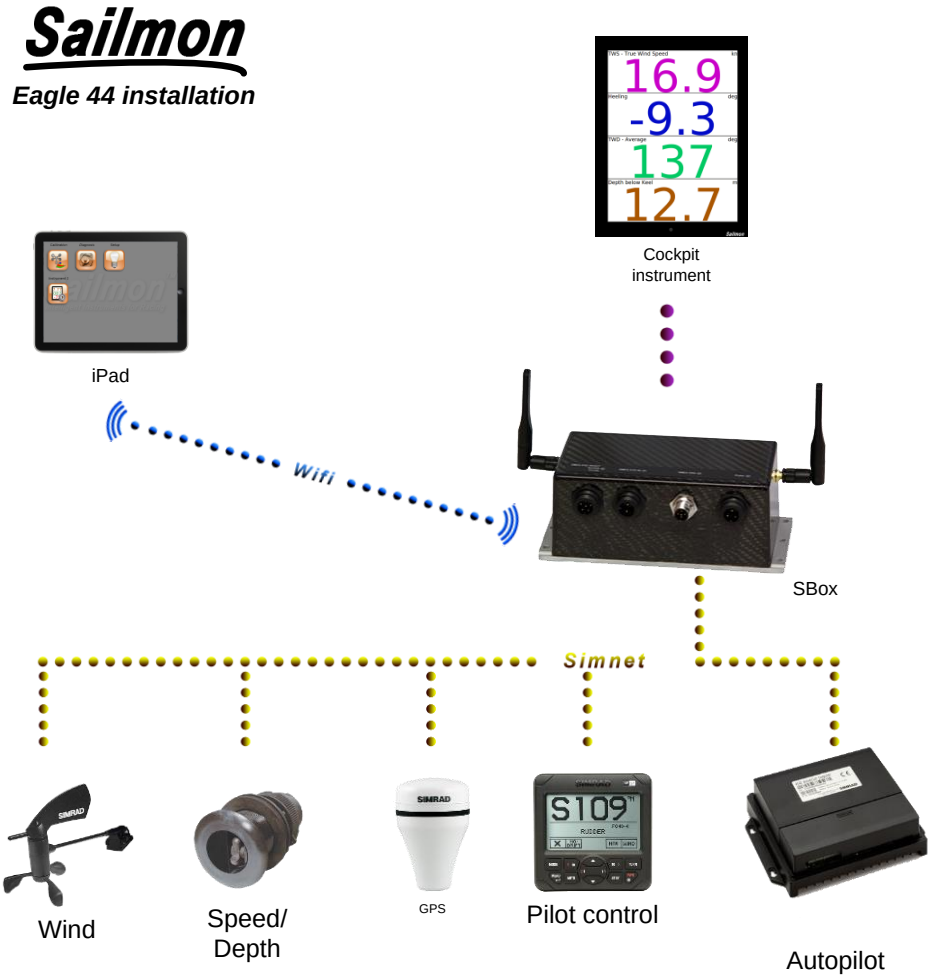


Conclusion: Installing a Sailmon instrument on an Outremer 49 brings kind of superyacht feeling to the crew. Professional performance data, graphical data representation and TV streaming will clearly make a difference.

EXAMPLE 4: EAGLE 44 TRADITIONAL DAYSAILOR

In this example one Sailmon instrument is installed on a traditional daysailor, an Eagle 44. The owner very much prefers good readability and nice design. Graphical elements are required. The boat is often transferred between 2 marinas; the transfer usually is done during the night. So the crew issued the wish to have reliable good viewable instruments for the night as well. Space on the backside of the screen is very limited.

Even if this boat has a traditional design, Sailmon's state of the art instruments perfectly fit on this type of boat. One single Sailmon instrument replaces all other instruments on board. Very well looking integration is possible due to the flush mount design of the Sailmons. Due to the overall thickness of just 30mm, the yacht designers were happy with the instrument not wasting any space inside the cabin.



Conclusion: Sailmon state of the art instruments fit perfectly on a traditional boat as well. The timeless design and the possibility make a nice integration possible. Due to the flexible architecture the Sailmon can read data out of almost all instrument system. In this case the shipyard installs Simrad devices.

EXAMPLE 5: X-YACHTS XP44 FOR PROFESSIONAL RACING

In this example a brand new XP44 should get racing equipment including professional instruments. The yacht is sometimes used for cruising, but most of the times a professional crew will take part in international races.

The owner wants the latest technology available, and has high demands on data precision. In case of important question or problems, he wants immediate assistance from the manufacturer.

The boat is well operated and calibrated, and regular polar data improvements are performed. During races the crew does rely on the instruments and excessively uses target speed and angle.

The crew has one member solely for tactic decisions and navigation.

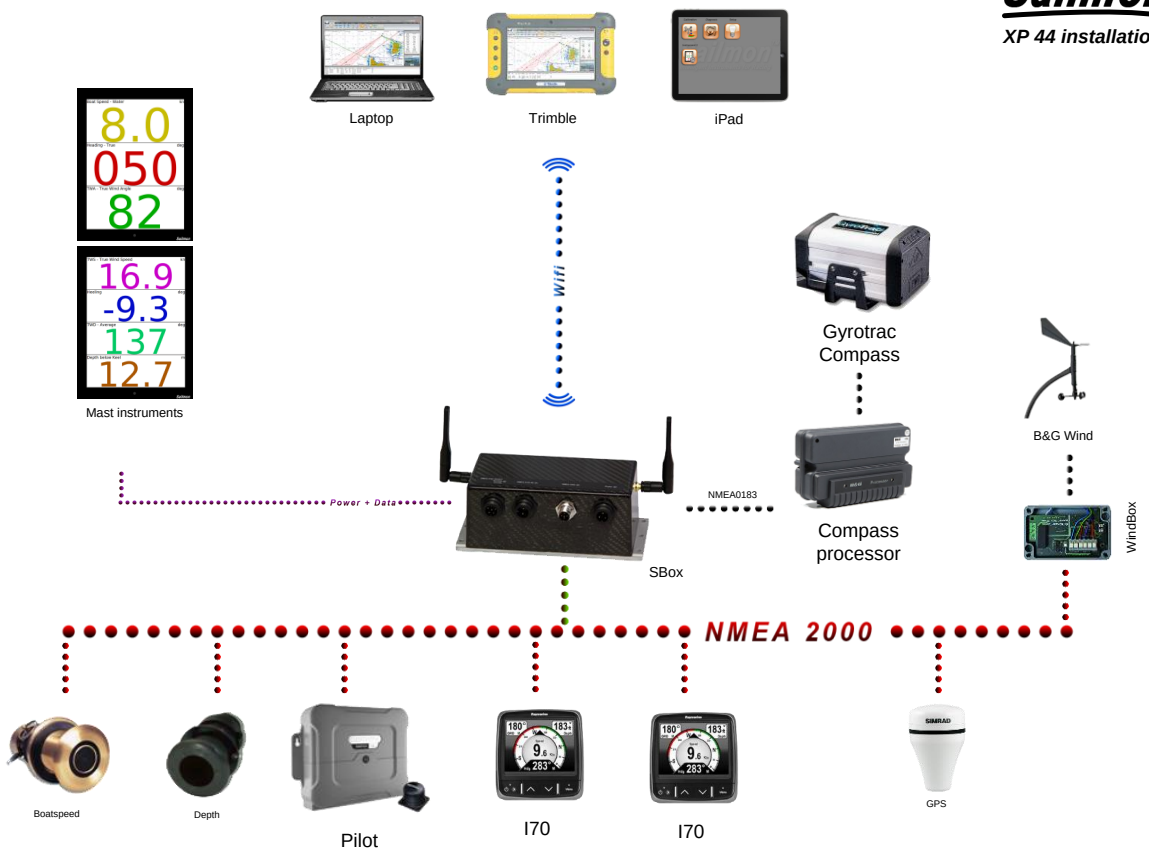
In this case the Sailmon instruments are a perfect choice. In the project phase, where the ship building is launched, the project manager together with Sailmon planes the optimum installation and the best sensors, according to the owners needs. Finally the instrument system is 100% optimized, without any compromises.

2 Sailmon instruments in portrait mode are installed on the mast, giving the opportunity to display up to 8 data values on the mast. (As soon as polar speed and angle are used, you will need at least 6 values)

Sensor selection includes an Airmar ultrasonic boatspeed sensor and a B&G vertical mast head unit together with the Sailmon WindBox. A KVH Gyrotrac compass delivers very stable compass heading and attitude data, which significantly increases the precision of many values, including wind.

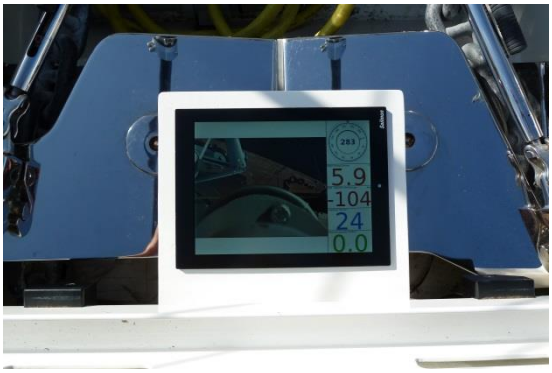
A tactical PC is used to run Expedition tactical software. The tactician has all the accurate Sailmon data inside this handheld device, and during pre-start and up-down races tactical data will be sent to Sailmon (Distance and time to startline, distance and time to layline etc.) Navigation, weather routing and sail selection take advantage of the precise Sailmon data.

After the races, sponsor videos are displayed on the Sailmons and the sponsor enjoys the benefits.



Conclusion: High level racing is possible together with precise data and perfect integration of the tactical PC. All data sources run into the SBox, a very powerful and flexible device. Sailmon is not limited to any sensor manufacturer, simply choose the best sensor!

EXAMPLE 6: 66M SUPERYACHT INSTALLATION



In this example the Sailmon is installed on a 216ft Dubious superyacht. The requirements from both the owner and the crew were relatively simple to describe here: They want the best they can get. Instead of the common instruments available, Sailmon MM104 instruments should be placed on the mast, the cockpit and the anchor locker. Live video together with data on every instrument is absolutely essential.

Needless to say that no compromise in design and visibility is tolerated here.

In this case Sailmon can show its real strength. It is perfectly suited to be installed together with the best equipment available. Designers are happy because of the nice design, the slim outline and the availability of all 3D CAD data to plan and render the installation.

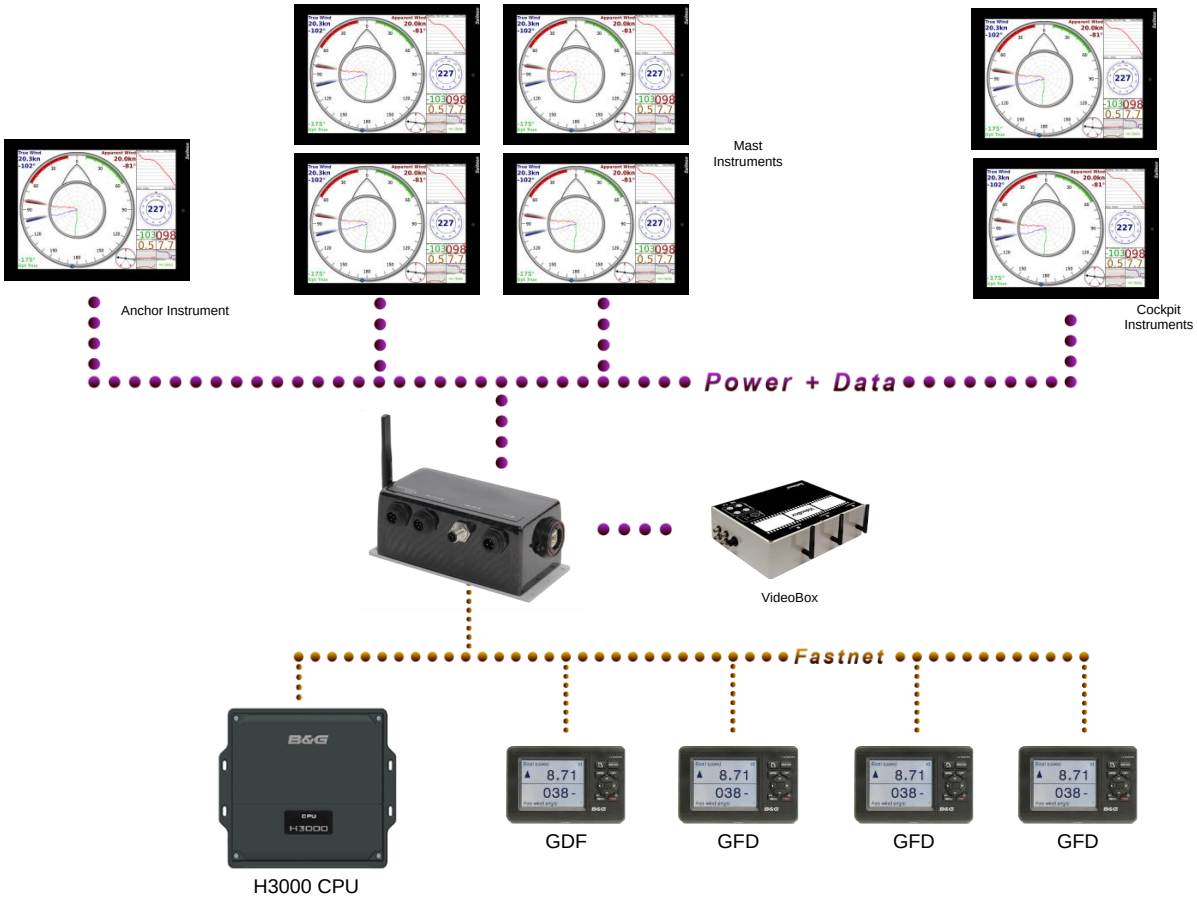
For the owner, it is something he is happy to look at. It's just extraordinary presentation of data, and makes people around astounded.

The crew does the daily work with the instruments. Together with the countless other electronic on this yacht, the Sailmons have to proof to be a professional system being switched on 24 hours a day, 7 days a week etc.

Due to the huge dimensions, several cameras are placed around the yacht; the ones necessary for sailing will be displayed together with the instrument data on every single MM104 instrument. One extra device, installed in the anchor locker, shows both the camera image from the underwater anchor camera, and data like depth and wind angle.

The wireless Sailmon network is improved with a wired backbone Ethernet transfer of data. 3 special SBox+ are mounted on the Bow, amidships and stern to provide 100% reliable wireless network on the yacht.

Regular maintenance of software is done by Sailmon technicians – this can be done remotely over Internet! Even if a problem occurs Sailmon can respond within very short time!



Conclusion: Sailmon brings a number of benefits to a superyacht: fancy design, ultimate performance and state of the art technology. It's simply the best you can get!

MM104LP

Picture 4: MM104MxG Monitor

The Sailmon MM104LP instrument is a very high brightness monitor with perfect anti glare combined with a high performance race computer in one slim case.

All data communication is performed wireless over a high performance communication which uses the two wires of the 12V/24V power supply to transfer the data. This allows very low installation effort and ultimate reliability. All MM104LP devices include a Wi-Fi transmitter, so they can be used to build up a wireless distribution network on your yacht. (Internet etc) Optionally the MM104LP can also receive data over a Wi-Fi network.

The MM104LP can be connected in daisy-chain. This means, only one cable is necessary from your switching panel to the mast. Fast-lock waterproof connectors reduce the installation effort to a minimum. The MM104LP includes the most powerful and intelligent technology available, including automatic backlight control with an ultra-high dimming ratio of 1:3000. This allows absolutely perfect readability under all conditions for convenient reading during day and night. Even high contrast and intense colors are maintained during night sailing. Perfect sunlight readability is achieved with a high-performance anti glare front screen. The front glass is optically bonded to the TFT display, avoiding an air gap. Therefore, you will never experience a foggy display. The MM104LP is further optimized for ultimate visibility with polarized sunglasses. Using polarized sunglasses will even improve the visibility of the instrument. The MM104LP can be ordered with either horizontal or vertical polarization.

WARNING: EVEN IF THE DISPLAY IS WELL PROTECTED AGAINST SALT WATER AND UV RADIATION, IT IS NECESSARY TO COVER THE MONITORS EVERY TIME YOU DON'T USE THEM. SAILMON PROVIDES SPECIAL SUN COVERS WHICH COME WITH THE MAST SUPPORT. REMOVE THE MM104LP AND STORE THEM IN A DRY AND DARK PLACE DURING WINTER. FAILING TO TREAT THE MONITORS PROPERLY WILL VOID GUARANTEE.

REMOVE SALT WATER FROM THE FRONT GLASS AFTER SAILING TO PREVENT DAMAGE. CLEAN THE MONITORS WITH FRESH WATER AND THE SAILMON CLEANING SHEET. DO NOT USE STRONG SOLVENTS, PETROL OR OTHER HARMFUL SUBSTANCES.

TECHNICAL SPECIFICATIONS:

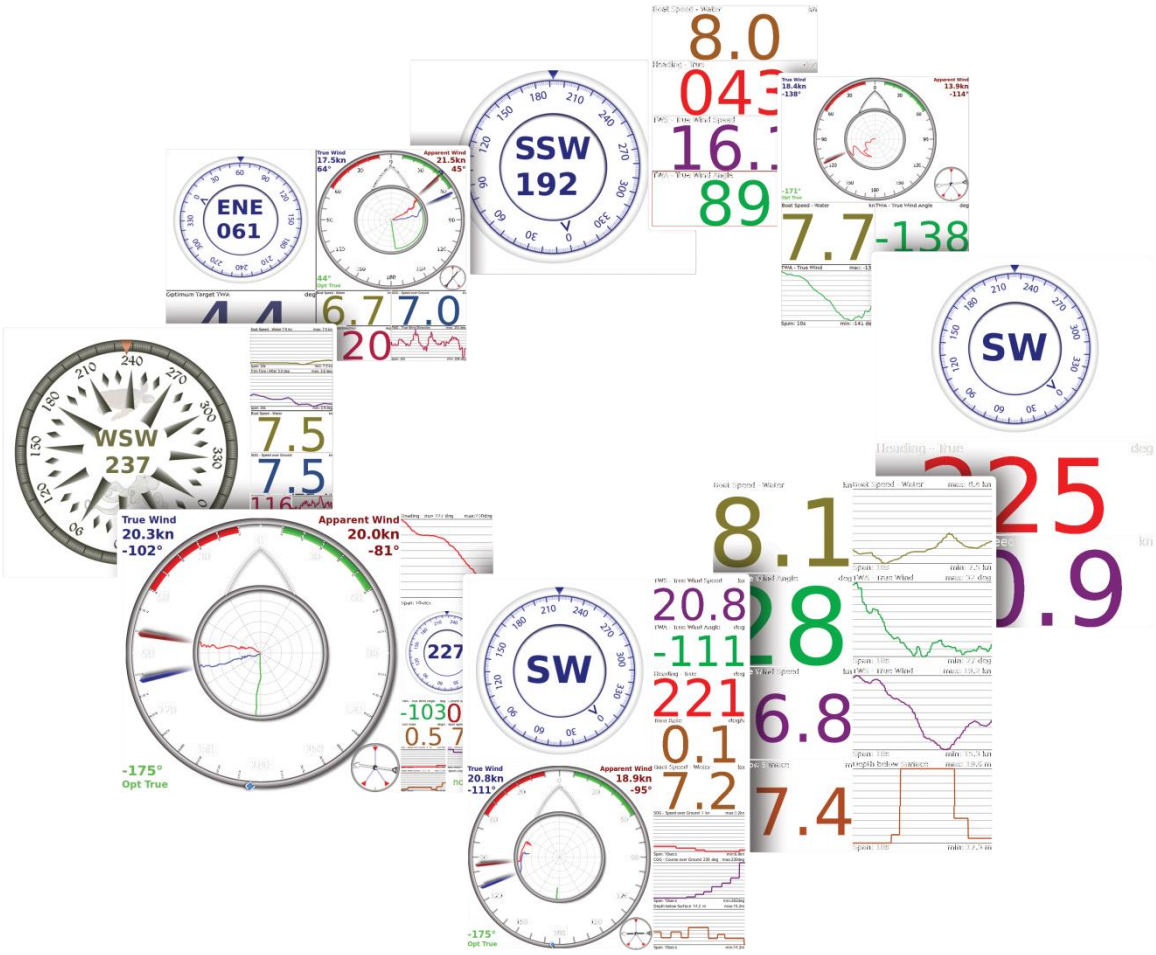
- Ultra bright sunlight readable display with world's best anti reflection
- Integrated high performance sail and race computer
- Professional race performance software included
- Automatic brightness control with anti-blind for night sailing
- Powerline communication with up to 200Mbit/s (100m range)
- Optional wireless secure communication with high power over 2.4 and 5GHz
- 26.5cm / 10.4 inch screen diameter, up to 12cm / 4.7 inch digit size
- TFT with LED backlight, max 1000nits, min 0.3 nits
- 12V or 24V service battery voltage, Consumption: 11W max, 7W avg.
- Dimension (H x W x D): 253mm x 189mm x 30mm
- Weight: 1200g
- Protection: IP65 completely sealed and waterproof
- Ambient Temperature Range: -10°C to 50°C, 14°F to 122°F

Package Content:

1 Mast Monitor MM104LP
4 Mounting Brackets (incl. Screws)
1 Cleaning Sheet

The MM104LP if fully configurable for the user. You can choose between an large number of layouts and elements.

- Data
- High performance race wind instrument
- Graphical compass
- 2D Plots
- Video from File
- Live video



You can use the MM104LP in 3 different modes.

- Stand alone mode: In this mode all sensors and interfaces are connected to the Sailmon SBox Wifi. The MM104LP is a high performance race system then. It provides ultra high performance calculations, calibration and operation. It's a complete race system!
- Add-on to any existing instrument system. Add it to any instrument system and use the extraordinary monitor to add professional readability to your yacht. Sailmon fully supports a number of systems, including Raymarine, Simrad, B&G, Nexus, Garmin and much more. All fancy features of the Sailmon instruments, like iPad control, video, graphical elements etc. are still available in this configuration.
- Race add-on for existing instruments. Imagine you have a standard instrument system on your yacht and you want to add race calibration and performance data to your yacht. That's exactly what the Sailmon MM104LP provides. You will be astounded about the data quality you can get out of any standard instrument system

Up to 16 single MM104LP instruments can be installed on a yacht, providing an excellent and complete instrumentation solution.

SBOX LP

The Sailmon SBox LP is a high performance sensor interface to the Sailmon system. It provides connections to all standard sensors and instrument systems, including B&G, Raymarine, NMEA2000, NMEA0183, Nexus FDX and SeaTalk.

Status LEDs will help you during installation. The SBox LP includes a transmitter for the Sailmon power line communication which transfers all instrument data over the 2 wires of the power supply. As soon as you connect the SBox and MM104LP devices to the 12V/24V power, the data communication is fine.

This allows very little installation requirements and ultimate reliability.

The SBox LP also includes a WiFi access point for communication with iPad, PC etc.A waterproof Ethernet connector is available to connect to any existing network. In this case you can use the MM104LP devices and the SBox LP as Internet distribution system with full roaming support.

NEVER GIVE AWAY THE NETWORK NAME OR THE PASSWORD. DOING SO MAY ALLOW ATTACKING AND CORRUPTING YOUR SYSTEM, OR READING OUT YOUR DATA.

TECHNICAL SPECIFICATIONS:

- Includes Sailmon powerline communication with up to 200MBits/s (100m range)
- Wireless high power and secure communication over 2.4GHz, 802.11 a/b/g/n
- Connect your Sensors over NMEA2000 or NMEA0183, SeaTalk, B&G Fastnet and Nexus FDX
- Perfectly compatible to existing Systems of B&G, Raymarine, Simrad, Garmin and Furuno
- 12V or 24V service battery voltage, Consumption: 6W max, 4W avg.
- Dimension (H x W x D): 180mm x 80mm x 69mm Weight: 650g
- Protection: IP54 sealed Ambient Temperature Range: -10°C to 50°C, 14°F to 122°F

Available Interfaces:

Interface	Option 1	Option 2	Option 3
Port 1	NMEA0183 /NMEA0183HS INPUT	SEATALK	Nexus FDX
Port 2	NMEA0183 /NMEA0183HS INPUT	B&G Fastnet	
Port 3	NMEA2000		

You can connect your sensors or existing instruments to any of the SBox LP ports. More interfaces can be used at the same time. In addition, several sensors of the same type can be connected to NMEA2000. The Sailmon software lets you choose which one you want to use during configuration.

The SBox LP has to be mounted in a well ventilated and dry place. Sailmon recommends a mounting position close to the navigation panel, since most of the interfaces are available there.

Package Content:

1 SBox LP
1 2.4GHz Antenna
1 Ethernet Cable, waterproof
1 SBox LP Power Cable 2m

Interface cables need to be ordered separately:

SBoxP1NMEA0183_Cable	SBox to NMEA0183 cable for Port 1
SBoxP2NMEA0183_Cable	SBox to NMEA0183 cable for Port 2
SBoxP2Fastnet_Cable	Cable SBox to B&G Fastnet Cable
SBoxP1SeaTalk_Cable	Cable SBox to Raymarine SeaTalk cable
SBoxP1NexusFDX_Cable	SBox to Nexus FDX Server cable

VIDEO BOX

The Sailmon Video Box adds live video support to your Sailmon instruments. Up to 4 video sources or cameras can be connected to the VideoBox. The video data will be converted to the Sailmon wireless network according the latest and most powerful video compression.

Picture 5: VideoBox

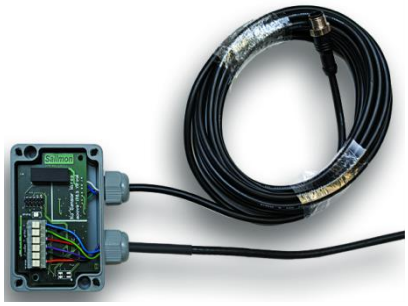
TECHNICAL SPECIFICATIONS:

Communication over Powerline Ethernet
Up to 4 live video channels at the same time
Composite PAL / NTSC
Unterminated Input possible to feed camera to both a monitor and the VideoBox
12V or 24V service battery voltage, Consumption: 20W max, 18W avg.
H.264 video encoding with maximum 150ms delay and 20fps

Package Content:

1 VideoBox
1 VideoBox Power Cable 2m

WIND BOX



The Sailmon WindBox offers an interface for B&G wind sensors to NMEA2000. With the WindBox you can directly connect B&G wind sensors to a Sailmon system. It can be used for both, the standard and the vertical mast head unit (213 Type). The NMEA2000 interface cable is pre-installed. For overvoltage and electrostatic discharge protection the WindBox is galvanically isolated.

Picture 6: WindBox

It will measure both wind speed and angle at an extraordinary high rate of 10Hz (Measurements per second). It is housed in a very small waterproof case and is rated IP65. A 5m NMEA2000 drop cable is preinstalled.

Additionally, the Wind Box features a direct compatibility to a Raymarine system. This means you can directly connect the Sailmon WindBox to a SeaTalk NG network and have all wind data available. Mast head unit calibration can be done directly with the ST70 instrument. Raymarine calibration is independent of Sailmon, so you can use the professional wind calibration features of Sailmon, while still being able to perform a simple MHU alignment offset with the ST70 instrument.

TECHNICAL SPECIFICATIONS:

Update rate: 10Hz for speed and angle
5m NMEA2000 drop cable (pre-installed) (SeaTalk NG on request)
Power Supply: 9-16V over NMEA2000
Dimensions (H x W x D): 98mm x 82mm x 33mm
Weight: 160g (Cable: 240g)
Protection: IP65
Ambient Temperature Range: -10°C to 50°C, 14°F to 122°F
Power Consumption: 10mA at 12V
Galvanic Isolation of MHU
NMEA2000 PGNs Supplied: 130306 (0x1FD02) with 10Hz, Sailmon proprietary 64231 (0xFAE7) for 100Hz MHU angle and speed
Direct Raymarine ST70 calibration support

Package Content:

1 WindBox with 5m NMEA2000 cable

LOADCELL BOX

The Sailmon™ Load Cell Box offers connection of load cells to the Sailmon system. It can be used to interface all common 4-wire or 6-wire load cells. Calibration is done with the Sailmon Software Tool. For overvoltage and electrostatic discharge protection the Load Cell Box is galvanically isolated.

It will measure tension or pressure with an update rate of 10Hz, allowing monitoring and logging rig tension. With the Sailmon System, the actual force can be displayed in N (Newton), kg, or % of nominal rig load.

It is housed in a very small waterproof case and is rated IP65.

Picture 7: Loadcell Box

TECHNICAL SPECIFICATIONS:

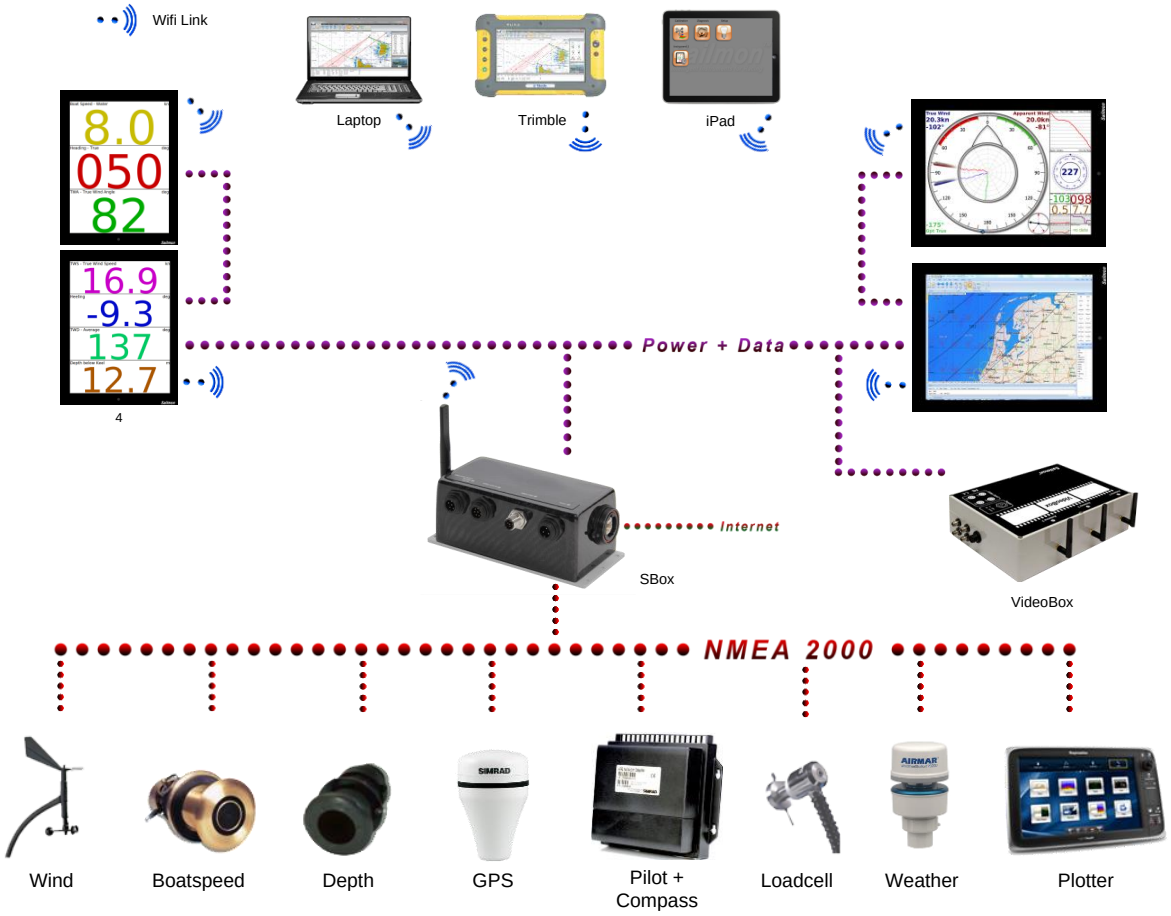
Update rate: 10Hz
5m NMEA2000 drop cable (pre-installed)
Accuracy: 1% over Temperature
Maximum input Voltage: ±39mV
Dimensions (H x W x D): 98mm x 82mm x 33mm
Weight: 160g (Cable: 240g)
Protection: IP65
Ambient Temperature Range: 0°C to 50°C, 32°F to 122°F
Power Supply: NMEA2000 compatible, 9-16V
Galvanic Isolation of Load Cell
NMEA2000 PGNs Supplied: 64221 (0x0FADD) Sailmon proprietary

Package Content:

1 LoadCellBox with 5m NMEA2000 cable

2 Sailmon Instruments – Technical information

UNDERSTANDING THE SAILMON INSTRUMENTS



All MM104LP devices include a high brightness display together with a full function race computer. Every single unit is connected to 12V or 24V.

The SBox LP is the interface to collect the ships sensor data. It has 3 flexible Ports which can be used simultaneously. Various different interfaces and instrument systems can be connected. The SBox also has a Wi-Fi access point included.

The SBox LP also has a standard ethernet connector, to connect a PC or Laptop to the Sailmon network. Even internet connection is possible, so the Sailmon instruments become an internet distribution system.

Every single MM104LP device has a build in Wi-Fi receiver and acess point. So, the MM104LP also becomes a wireless acess point where devices like iPad, tactical tablet etc. can connect to and exchange data with Sailmon. It even distributes internet on your deck. As soon you are in range of one MM104LP instrument, you have internet acess with your tablet etc!

In the rare case where powerline ethernet is not possible, the MM104LP devices can also connect over Wi-Fi. To enable this feature, they need to be paired with your SBox. See Pairing of the MM104 instrument on page 60 for details.

THE SAILMON BUS

Sailmon uses a very advanced method of exchanging data between the instruments. Unlike other instrument systems where you need data and power connections, Sailmon uses the same two wires for power and data. This concept is called powerline ethernet. Communication speed up to 200MBits/s can be achieved here.

This means that for the installation, it is enough to just connect plus and minus of every Sailmon device to your main switching panel. As soon they are connected, the Sailmon devices can communicate with very high speed and low latency. The data exchange is fine for up to 100m cable length, which is sufficient for even the largest boats.

The complete Sailmon bus is self configuring in standard configuration, so no settings need to be done. As soon the power is on, the instruments will start working

SAILMON SYSTEM CONSIDERATIONS

The Sailmon System is a high performance instrument system. In contrast to recent instrument systems, there is no separate central computer or processor. Instead, every MM104LP monitor is a complete sail and race computer.

This leads to very high calculation power and a lot of advantages during system operation. However, to make sure the system is operating correctly it is necessary to determine one monitor to be the supervisor of the Sailmon system. This Monitor is called server.

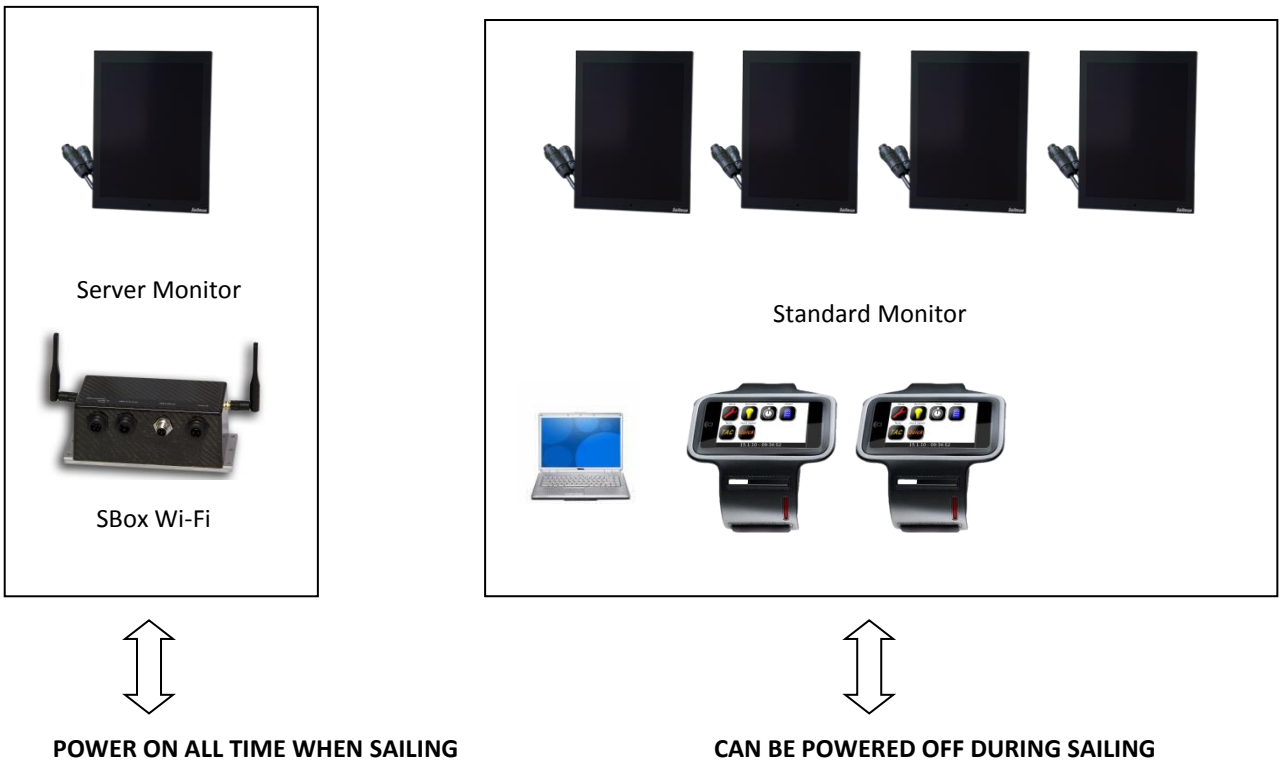
It is necessary to manually set one monitor as server during system installation.

This is done with the Sailmon Tool and a PC or laptop. Sailmon delivers a preconfigured system, which means if you buy a new system, there is already one monitor configured as server. This monitor is marked with a special label on the front glass protector foil. See the Sailmon Tool documentation for information how to change the server.

THE SERVER MONITOR AND THE SBOX LP HAVE TO BE POWERED ALL TIME YOU OPERATE THE SAILMON SYSTEM! YOU WILL NOT GET ANY DATA VALUE IF THERE IS NO SERVER CONFIGURED OR THE SERVER IS POWERED OFF. REMOTE CONTROL OPERATION IS ALSO NOT POSSIBLE IN THIS CASE.

This also means you can power down different monitors during system operation.

For example: You want to have 3 monitors installed: 4 on the mast and one in the cockpit. You like to swich off the 4 monitors on the mast ocassionally to save battery. You have to configure the monitor in the cockpit to be server. Remind, the monitor in the cockpit has to be powered when you want to use the 4 mast monitors.



Picture 8: Sailmon server configuration

3 Installation Preparations

REQUIRED PARTS

The Sailmon System needs as a minimum one Monitor MM104LP and one SBox LP . Optional accessories are a carbon fiber mast support, WindBox, LoadCellBox or VideoBox. Data can be fetched from existing instrument systems, or directly from sensors. See the Sailmon Calibration manual and data reference for details.

A typical installation includes (excluding sensors):

Part Nr.	**Part count**
MM104LP, Monitor 10.4”	Depending on your configuration
MSxL, MSxP, Mast Support carbon	1
SBOX LP	1
Mast Power Cable	1
Sbox cables according actual interfaces	NMEA0183, NMEA2000, Fastnet, Nexus FDX, SeaTalk

The Sailmon Calibration Manual and Data Reference will give detailed hints on proper sensor selection.

Ask your dealer for your optimum configuration or contact info@sailmon.com if you need any assistance in choosing the right parts.

STEP 1: CHOOSE A MOUNTING LOCATION FOR THE MM104LP MONITORS

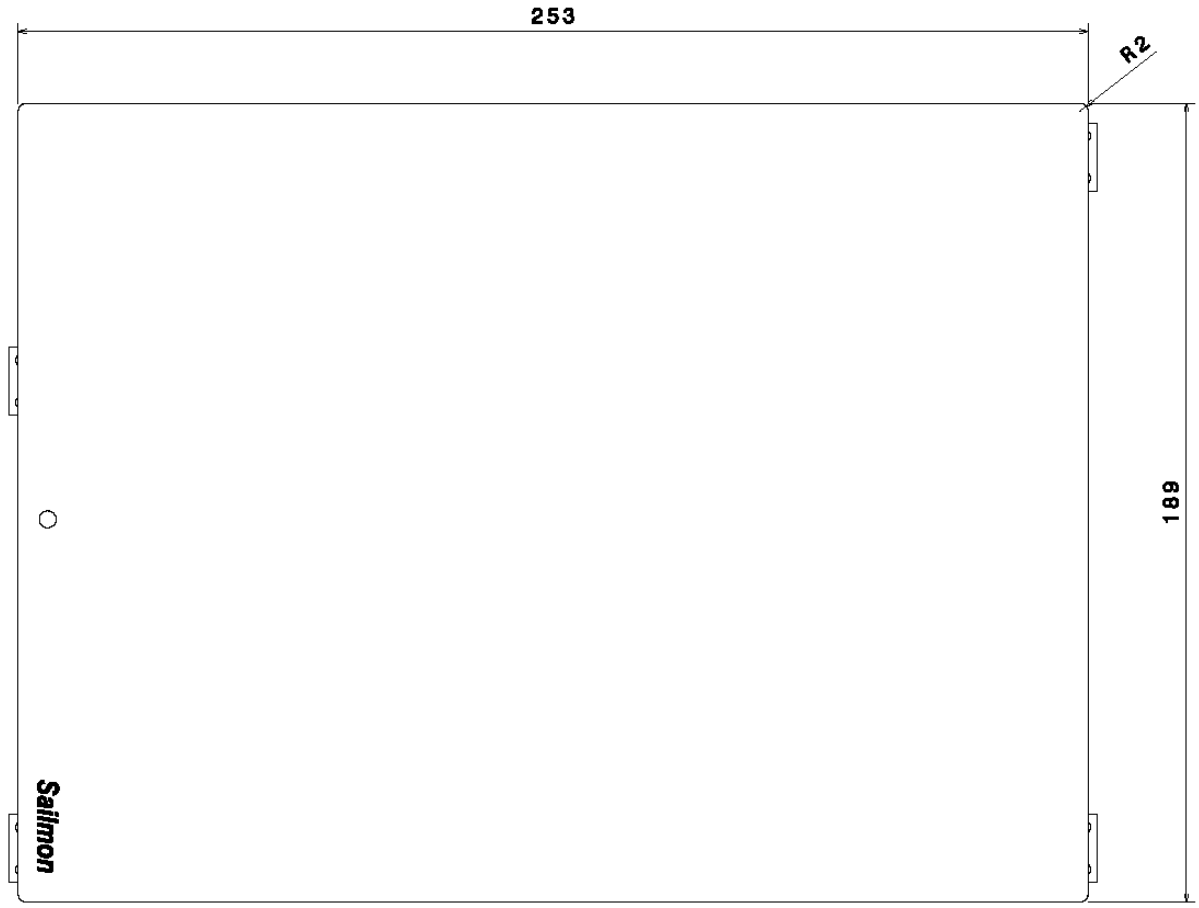
WARNING: WHEREEVER YOU INSTALL THE MM104LP MONITORS, MAKE SURE THE BACKSIDE OF THE MONITORS IS WELL VENTILATED. OVERHEATING MAY OCCURE IF BACKSIDE IS COVERED. AVOID DIRECT SUNLIGHT TO THE MONITORS BACKSIDE!

The MM104LP monitors have been developed for mast or cockpit mount. The monitors are optimized for minimum heat development. However, direct sunlight in combination with very hot temperatures and missing ventilation may cause overheating.

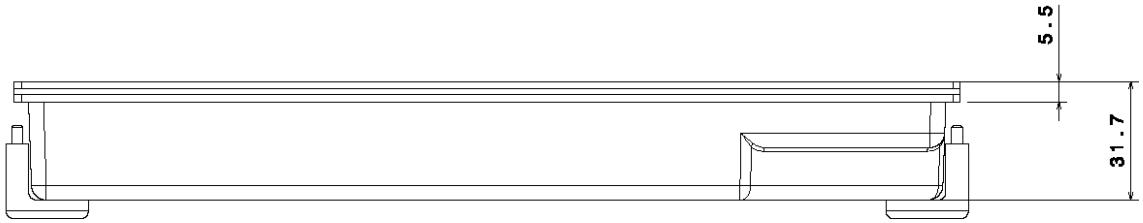
Cockpit installation:

Sailmon instruments are optimized to fit perfectly into your yachts design. One way to achieve a perfect surface ist that Sailmon usually are flush mounted. This means they appear to create one surface with the panel.

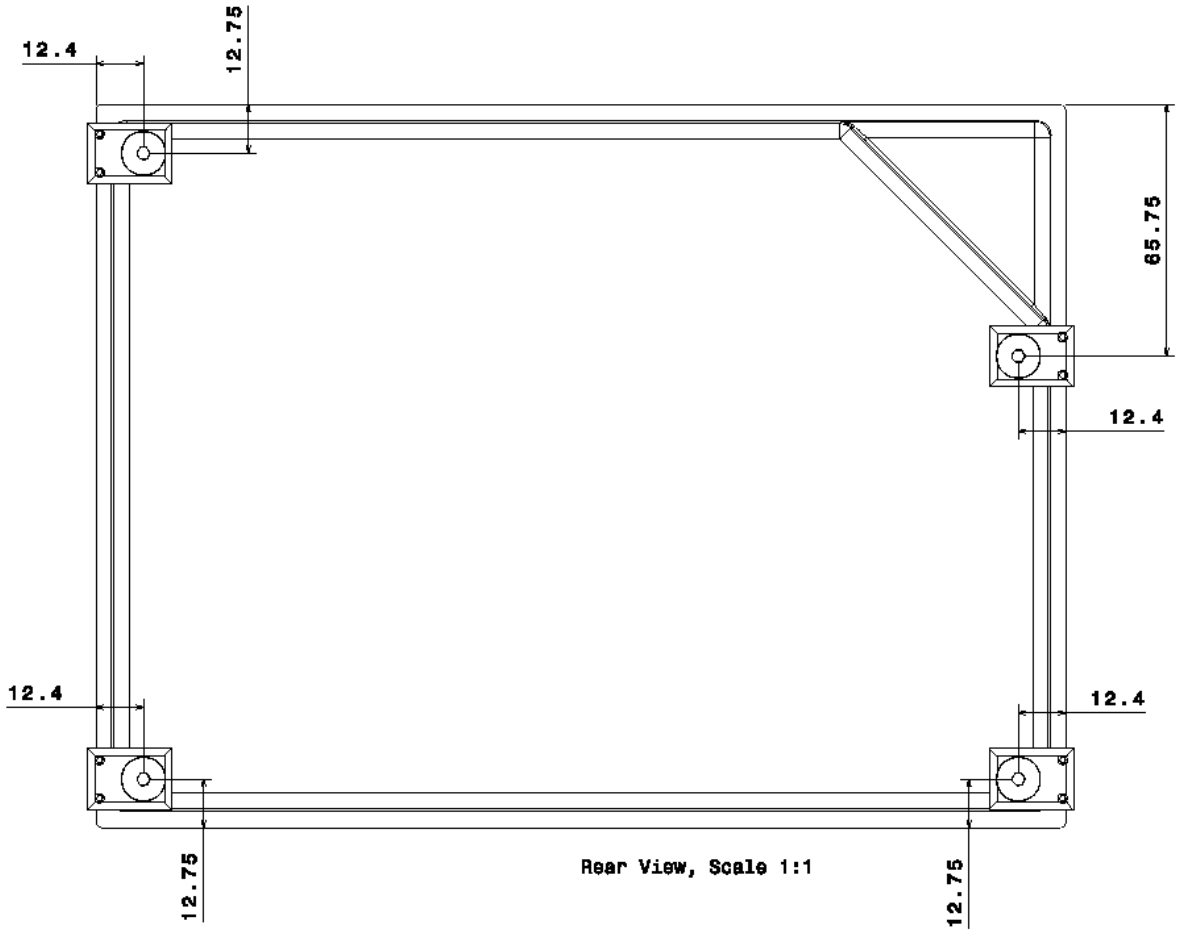
Flush mounting will need some preparation. Usually, exact milling of the panel is necessary. Sailmon can provide 3D files for your CAD system. Contact info@sailmon.com in this case.



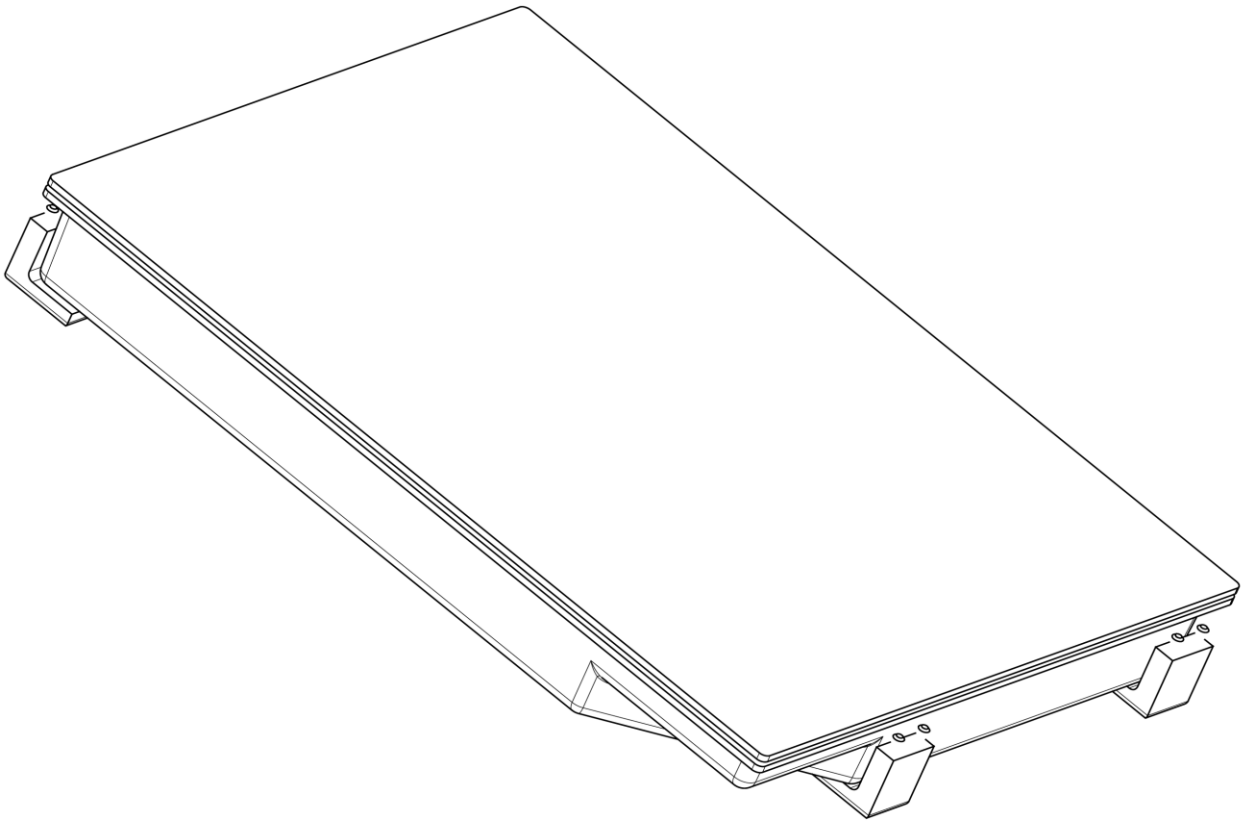
Picture 9: MM104 Front view



Picture 10: MM104 Side view

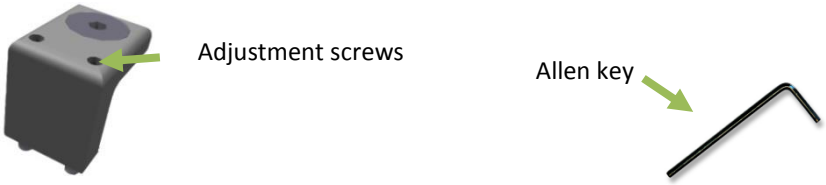


Picture 11: MM104 Bottom view



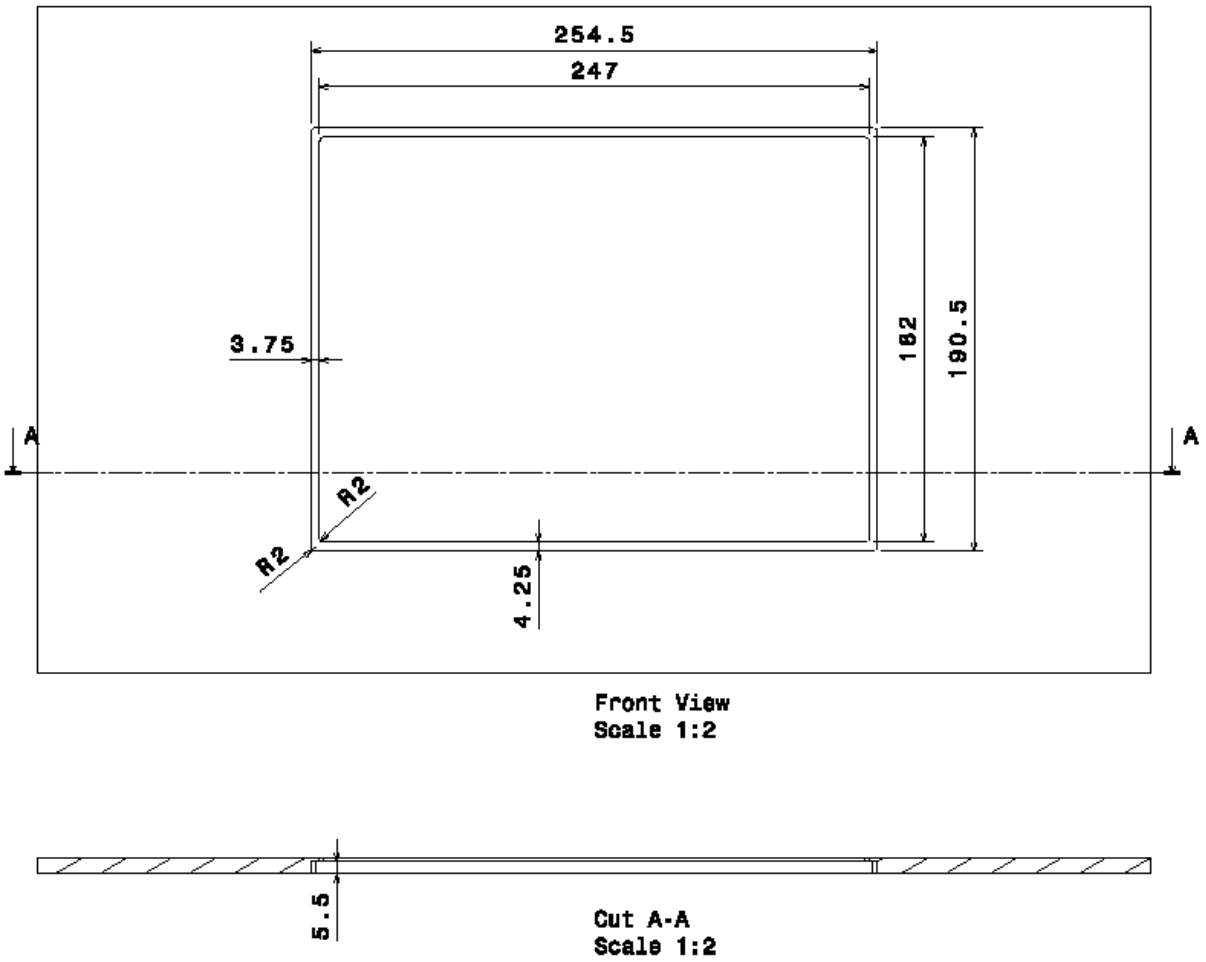
Picture 12: MM104 Isometric view

The MM104LP monitors are fixes with special flanges, which are part of the monitor package.



Picture 13: Mounting flange

These flanges allow perfect adjustment of the monitor position. Use a 1.5mm Allen-key to adjust the small screws inside the flange. If you remove the adjust screws from the flange make sure you cover them with a Teflon-compound when reinstalling. You will experience electrochemical corrosion otherwise.



Picture 14: Milling dimensions for flush mounting

Tips for flush mounting:

1. The front glass has a thermal expansion, so one must leave some space between the cutout and the MM104 device. We suggest using the same cutout dimensions we use for our carbon mast supports. See drawing. (Note: the thermal expansion of the front glass is 85*10E-6 per Kelvin). **Avoid any applied force to the front glass (bending, torsion, pressure etc.)**

2. Where the monitors are likely to be installed in direct sunlight, a UV-protection cover has to be used when the monitors are not in use. Sailmon mast supports uses UV-Protective persennings, this should be considered for custom mounting solutions as well.

3. For tolerance compensation and better cleaning, one should consider flush mounting the MM104 devices with a slight protrusion. Sailmon uses a protrusion of 0.5mm. (This means the MM104 glass surface is about 0.5mm above the surface in which the MM104 are mounted) As a consequence, we use a cutout depth of 5.5mm, since the MM104 front thickness is 6mm.

Installation on the mast

Correct mounting location: The monitors together with the mast support are designed to be mounted in between the boom and the boom vang. Extensive space is provided by the mast support to feed the ropes near the mast in between the mast and the mast support. Make sure all the ropes can be fed in a way that they do not touch the mast support with any boom position.

Picture 15: Typical MM104MxG installation

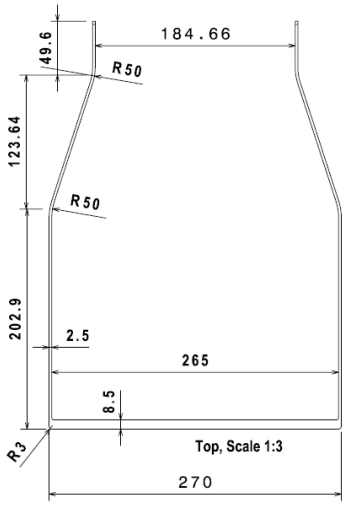
The mast support comes with a number of fixing holes, depending on the type of mast support. Make sure all screws are well fitted before you go sailing. Failing so will lead to vibrations and serious damage.

Sailmon recommends using the standard M6 screws which come with the mast support and a rivet with M6 thread. Choose rivets made of aluminum or stainless steel to avoid corrosion. If you use aluminum rivets, make sure no salt water will come in the thread to prevent electrochemical corrosion between the rivet and the stainless steel screw. Apply salt water resistive grease or Teflon compound on the thread before mounting.

Sailmon provides technical drawings for all available mast supports on www.sailmon.com

Make sure to double check the position of the installation before drilling the mast.

WARNING: ALWAYS ASK YOUR MAST MANUFACTURER IF HOLES IN THE MAST FOR THIS SUPPORT ARE ALLOWED. SAILMON DOES NOT TAKE ANY RESPONSIBILITY FOR MECHANICAL PROBLEMS OR MAST DAMAGE DUE TO IMPROPER MOUNTING LOCATION, STABILITY ISSUES OR FURTHER DAMAGE OR INJURIES.



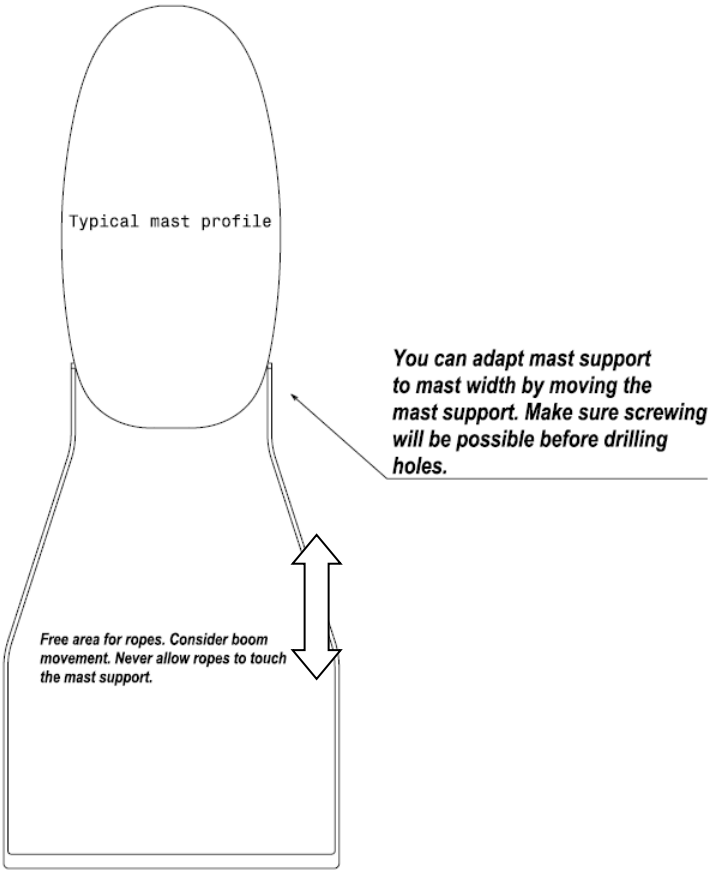
Picture 16: Dimensions of mast support landscape

Choosing the correct drill hole position: Sailmon mast supports are designed to easily fit on a variety of masts. A typical mast profile allows installing a mast support without strong mechanical forces, pressure or tension on the support. Never allow the front of the mast supports, where the monitors are located, to bend. This will result in serious monitor damage.

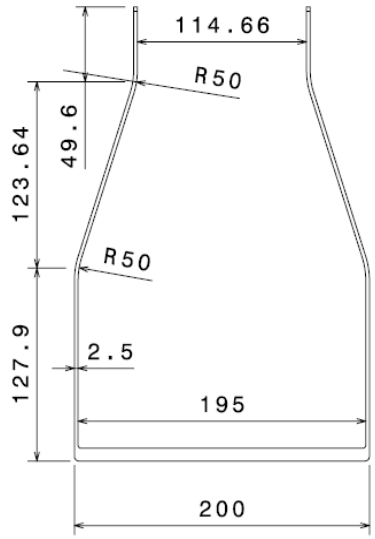
The width of the mounting brackets is approx. 185mm for the landscape supports, and approx. 115mm for the portrait supports.

It is possible to adjust the mast supports for about ±10mm mast width.

You can fit the support on your mast by moving it to the bow or stern, provided the mast width is typically decreasing at the stern side.


Typical mast profile
You can adapt mast support to mast width by moving the mast support. Make sure screwing will be possible before drilling holes.
Free area for ropes. Consider boom movement. Never allow ropes to touch the mast support.

Picture 17: Mast width adjustment



Picture 18: Dimensions of mast support portrait

4 Installation

INSTALLING THE MAST SUPPORT

STEP 1: MOUNT THE MONITORS INTO THE MAST SUPPORT

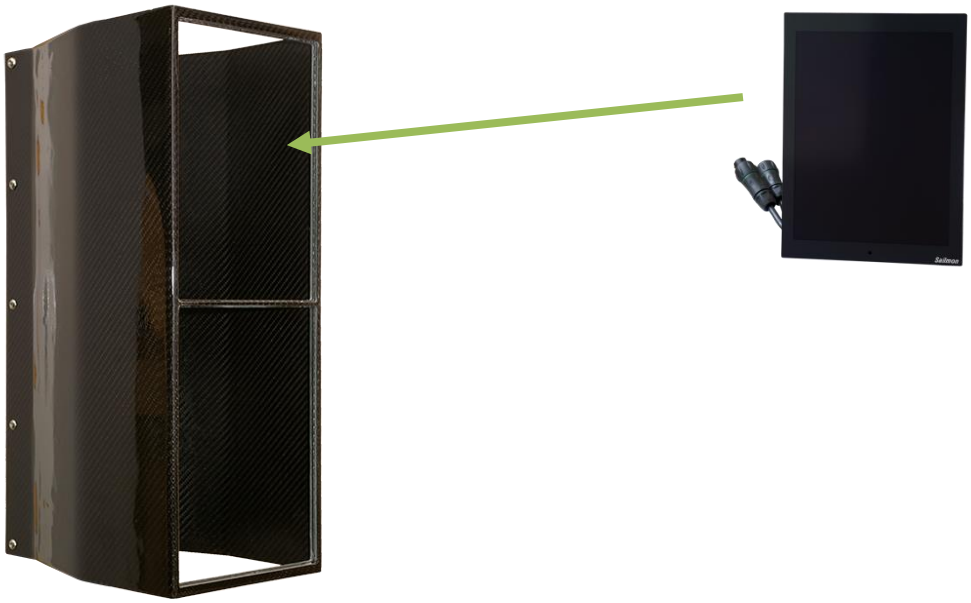
If you order a complete Sailmon instrument system, the MM104 monitors are usually already mounted inside the mast supports in the factory. Continue with step 2 in this case.

USE ALL 4 FLANGES PER MONITOR.

Picture 19: MM104LP back view

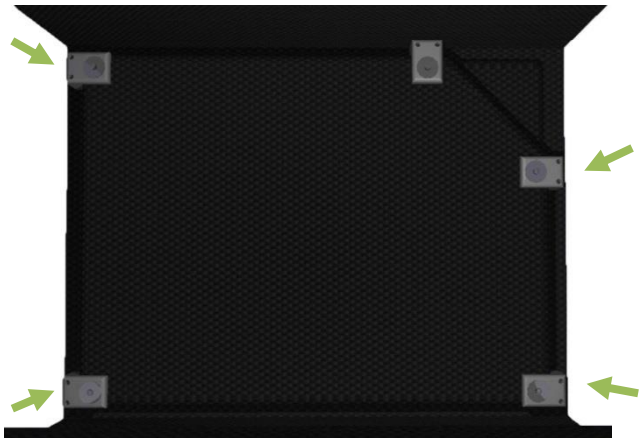
- Take out the monitor of the packaging and check for any damage. Do not remove the screen protector at this time.

- Insert the first monitor into the mast support opening. The support is symmetrically. However, the monitor cable outlet will point to the bottom side of the support. Therefore, you have to decide for a top and bottom position now.



Picture 20: Mast support installation

- Mount the flanges: Make sure the pair of small adjust-screws inside the flange is totally screwed into the flange before mounting to avoid tensions. Use an Allen-key to mount 4 or preferably 5 flanges on the monitor backside. Hands tighten only!



Picture 21: Flange mount

- Adjust the flange adjust screws by tightly screwing in and out the small screws.

VERY LOW TORQUE IS REQUIRED TO TIGHTEN THE ADJUST SCREWS. CHASSIS DAMAGE WILL OCCURE IF YOU SCREW THEM TOO TIGHT.

Picture 22: Flange adjustment

- Check the monitor for a proper fit.
- Repeat these steps for the other monitors

STEP 2: MARK THE MAST DRILL HOLES (ONLY 2 TOP HOLES)

The next step is to mark the position of the top drill holes on the mast.

YOU WILL NEED 2 PERSONS WHEN MOUNTING THE SUPPORT TO MAKE A GOOD JOB

Bring the monitor to the mast and use a marker to mark the positions of **only the 2 top drill holes**. Make sure the mast support fits perfectly before drilling.

Consider the hole size: Depending on how you fix the mast support, choose the right hole size. If you use rivets, look for the rivet manufactures' instructions. If you want to cut a thread into the mast profile, drill only the core-hole diameter, which is approx. 5mm for the delivered M6 screws.

Double check if the mast allows holes to be drilled on the marked positions without damaging some part of the mast or ropes, cables etc. inside the mast.

STEP 3: DRILL THE 2 TOP HOLES

DRILL ONLY THE 2 TOP HOLES AT THIS TIME. DRILLING ALL HOLES NOW WILL LEAD TO PROBLEMS, IN CONSEQUENCE THERE IS NO 100% FIT AND THE HOLES WON'T BE ACCURATE.

Now, the top 2 holes can be drilled. Make sure you do not damage parts inside the mast.

STEP 4: FIT THE RIVETS OR CUT THE THREADS

You can now fit the rivets for the top holes to the mast. Make sure you consider the rivet manufacturers instructions. If you have chosen to cut a thread into the mast do so now.

STEP 5: FIX TEMPORARY AND ADJUST THE MAST SUPPORT ON THE MAST

Mount the support on the mast with the 2 top screws.

STEP 6: MARK THE BOTTOM HOLES

The next step is to mark the position of the bottom drill holes on the mast. Make sure the mast support is in parallel to the mast.

STEP 7: DRILL THE BOTTOM HOLES

Remove the mast support and drill **only the 2 bottom holes** now. Mount the rivets or cut the threads.

STEP 8: DRILL THE REMAINING HOLES

Temporary fix the mast support again and **fix the 2 top screws and the 2 bottom screws**.

Drill the remaining holes, keeping the mast support installed. This makes sure all holes have a perfect fit.

STEP 9: MARK THE HOLE FOR THE CABLE

Do not forget to mark a proper entry for the mast power cable now.

STEP 10: REMOVE THE MAST SUPPORT

Remove the mast support, fit the rivets or cut the thread, and drill the cable hole.

INSTALLING THE MAST POWER CABLE

Select the cross section of the power cable depending on the cable length of your installation. Use the Sailmon Mast Power Cable according to this table:

Cable Selection Guide			
Number of Monitors	Cable Length	Battery Voltage	Recommended Cable
1 or 2	10m	12V or 24V	MC1MM10M
1 or 2	20m	12V or 24V	MC2.5MM20M
3	10m	12V or 24V	MC2.5MM10M
4,5,6	10m	12V or 24V	MC2.5MM10M
4,5,6	20m	12V or 24V	MC4.0MM20M
Other cases			contact Sailmon support

The cable length is the measured distance from the main switching panel to the monitors. Avoid excessive voltage drop due to improper cable cross section. Cut the cable to the correct length. **Do not make rings of excessive cable inside the switching panel or elsewhere.** Best efficiency and lowest battery consumption is achieved when optimizing cable length to a minimum.

THE MINIMUM VOLTAGE ON THE MONITOR CONNECTOR MUST NOT FALL BELOW 9.0 VOLTS. UNDERVOLTAGE WILL CAUSE SYSTEM RESET AND SYSTEM INSTABILITY.

Make sure the cross section of the cables from the battery to the switching panel is sufficient. Consult a technician or Sailmon support in case of doubt.

Large currents due to switching of electrical winches or other high power devices will cause undervoltages for a short time. The MM104 will handle this short-term voltage drop if the voltage on the monitors stays well above 6.5 Volts. You might experience a short blinking of the display as a result of the low voltage. A voltage below 6.5 Volts will result in immediate monitor reset and reboot.

STEP 1: FEED THE CABLE

You can now feed the mast power cable from the mast to the switching panel. Do not remove the plastic connector from the cable. Feed the cable from outside the yacht to the inside.

EVEN IF THE SAILMON SYSTEM IS DESIGNED INTO ALL GOVERNMENT REGULATIONS FOR EMI, IT IS RECOMMENDED TO KEEP A DISTANCE FROM THE POWER CABLE TO SENSITIVE DEVICES AND SAFETY DEVICES. ALWAYS TEST DEVICES WHICH ARE ESSENTIAL FOR SHIPS AND CREW SAFETY FOR PROPER OPERATION AFTER INSTALLING THE SAILMON SYSTEM.

FUSING

NEVER INSTALL ANY PART OF THE SAILMON SYSTEM WITHOUT A FUSE

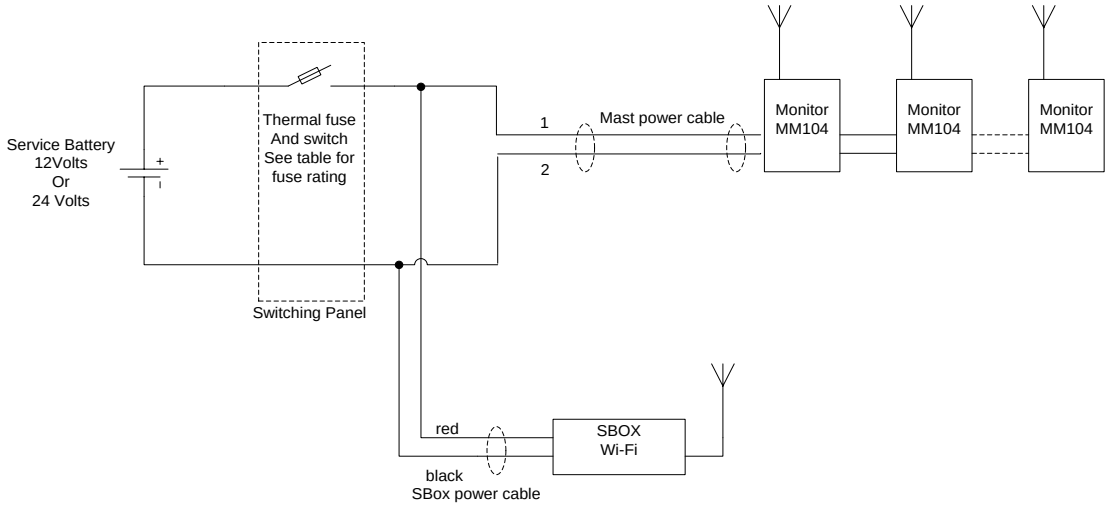
It is of utmost importance to place a fuse between the battery and the Sailmon devices. Sailmon recommends using a thermal fuse and switch combination, mounted in the main switching panel.

The fuse ratings must be:

Number of monitors	Battery voltage	Fuse rated current
1,2	12V	6A
3,4	12V	12A
5,6	12V	16A
1,2	24V	6A
3,4	24V	10A
5,6	24V	12A

Table 2: Fuse rating

The power consumption of the SBox LP is already included in the fuse rating.



Picture 23: Basic electrical installation

Water Plug: Use the delivered water protection plug for the last monitor connector to seal the power supply plugs.

CHOOSING THE INTERFACES

The SBox LP is a very powerful device with all common communication interfaces. It can be powered from either 12V or 24V batteries.

The SBox serves as an access point for all of the wireless communication in the Sailmon system. This means, every part of the system, including the monitors, your laptop and the WMR100 remote control will send and receive its information over the SBox Wi-Fi.

Interface	Option 1	Option 2	Option 3
Port 1	NMEA0183 /NMEA0183HS	SEATALK	Nexus FDX
Port 2	NMEA0183 /NMEA0183HS	B&G Fastnet	
Port 3	NMEA2000		

Table 3: Available Interfaces

If you have multiple interfaces available, use the following priority scheme to get the best system performance:

Interface	Data Quality
NMEA2000, SEATALK2, SIMNET, B&G Fastnet, Nexus FDX	Best
NMEA0183-HS (38400baud)	Good
SEATALK	Ok
NMEA0183	Ok

Table 4: Interface priorities

It is possible to send the data of one sensor to two different ports. The Sailmon Configuration Tool will let you choose the preferred interface during configuration.

More interfaces can be used at the same time. In addition, several sensors of the same type can be connected to NMEA2000. The Sailmon software lets you choose which one you want to use during configuration.

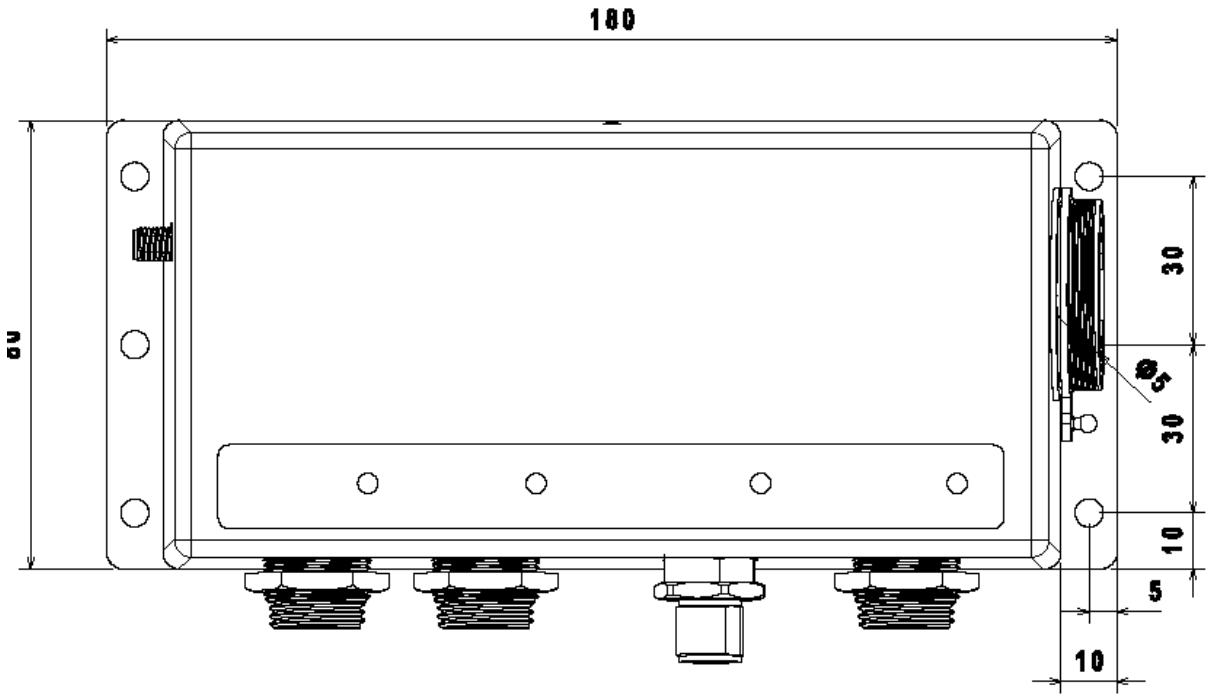
However, due to hardware restrictions, it is not possible to use the B&G Fastnet and the Nexus FDX interface at the same time.

MOUNTING THE SBOX WI-FI

The SBox LP has to be mounted in a well ventilated and dry place. Sailmon recommends a mounting position close to the navigation panel, since most of the interfaces are available there. Do not mount the SBox in a metallic or carbon fiber case without using external antennas (Part Number: SBOXEANT).

The SBox can be mounted in any orientation; the antennas can be tilted to get the best reception quality.

THE SBOX CHASSIS IS MADE OF CARBON FIBER. CARBON IS ELECTRICALLY CONDUCTIVE. NEVER LET ELECTRICAL CABLES OR THE LIKE CONTACT THE CHASSIS. HIGH RISK OF FIRE!



Picture 24: SBox LP dimensions

CONNECTING THE INTERFACES

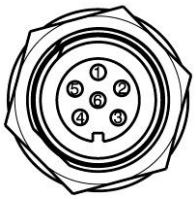
PORT 1:

This is a multifunctional port with various input capabilities. You can select the different options with the Sailmon tool on you PC during installation. Only one of the options of port 1 can be selected at a time.

Valid data on Port 1 are indicated by a blue LED next to the Port 1 label

WARNIG: PORT 1 OPERATION MODE MUST BE SET DURING INSTALLATION. USE THE SAILMON TOOL ON THE PC FOR SETTING THE CORRECT OPTION BEFORE CONNECTING THE CABLE TO PORT1 TO AVOID DAMAGES.

Port 1 connector pins:



Picture 25: Port 1 pins

Sbox_P1_NMEA0183_Cable colors	Function
Red	NMEA IN+
Blue	NMEA IN -

OPTION 1: STANDARD NMEA0183 COMPATIBLE INPUT

The settings are:

Baud Rate [bps]	Data bits	Stop bits	Parity	Handshake
4800	8	1	None (N)	None (N)

Table 5: Port 1 Option 1 interface settings

In option 1 mode port 1 outputs NMEA0183 data from the Sailmon system. You can connect this output to any device with an NMEA0183 compatible input.

SEE THE NMEA SENTENCE LIST IN

APPENDIX B: SBOX **LP NMEA0183 SENTENCES**

Appendix B: SBox LP NMEA0183 sentences FOR FURTHER DETAILS.

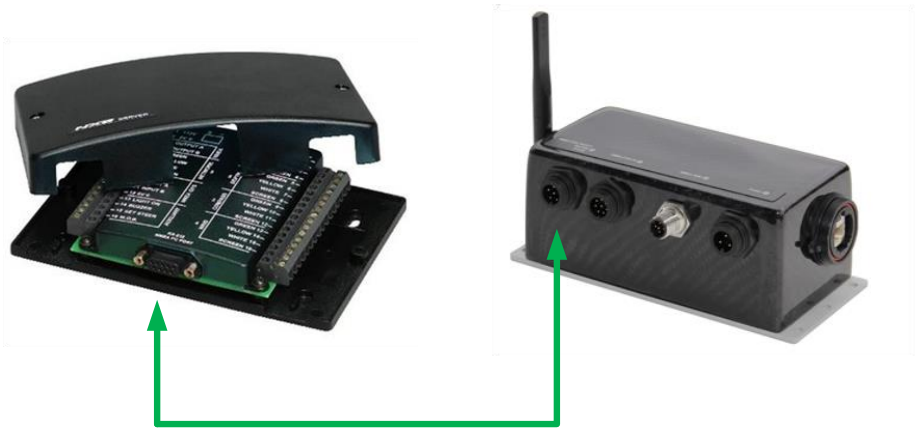
OPTION3: RAYMARINE™ SEATALK

Selecting Option 2 will activate the SeaTalk Input on Port 1. Use the Sailmon SeaTalk Cable, Part Number Sbox_P1_Seatalk_Cable, for connecting standard Raymarine™ instruments to the SBox Wi-Fi.

OPTION4: NEXUS FDX

WIRING

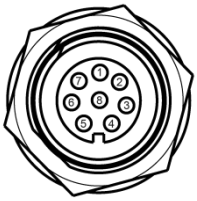
The connection to a Nexus network you need the Sailmon cable Part Nr.: **SBox-P1-Nexus_FDX_CABLE**



Picture 26: Nexus Server Connection

Nexus Wakeup: The Nexus server has to be switched to FDX mode after startup. The Sailmon SBox will perform this task automatically as soon as a connection to the Nexus server is discovered! No manual wakeup is necessary. Also, it is of no importance if the SBox is powered on before or after the Nexus server.

PORT 2



Picture 27: Port 2 pins

OPTION1: NMEA0183

This is an auxilary NMEA0183 input.

The settings are:

Baud Rate [bps]	Data bits	Stop bits	Parity	Handshake
4800	8	1	None (N)	None (N)

Table 6: Port2 interface settings

Sailmon SBox_P2_NMEA0183_Cable color coding:

Cable color	Function
Red	NMEA IN+
Blue	NMEA IN -

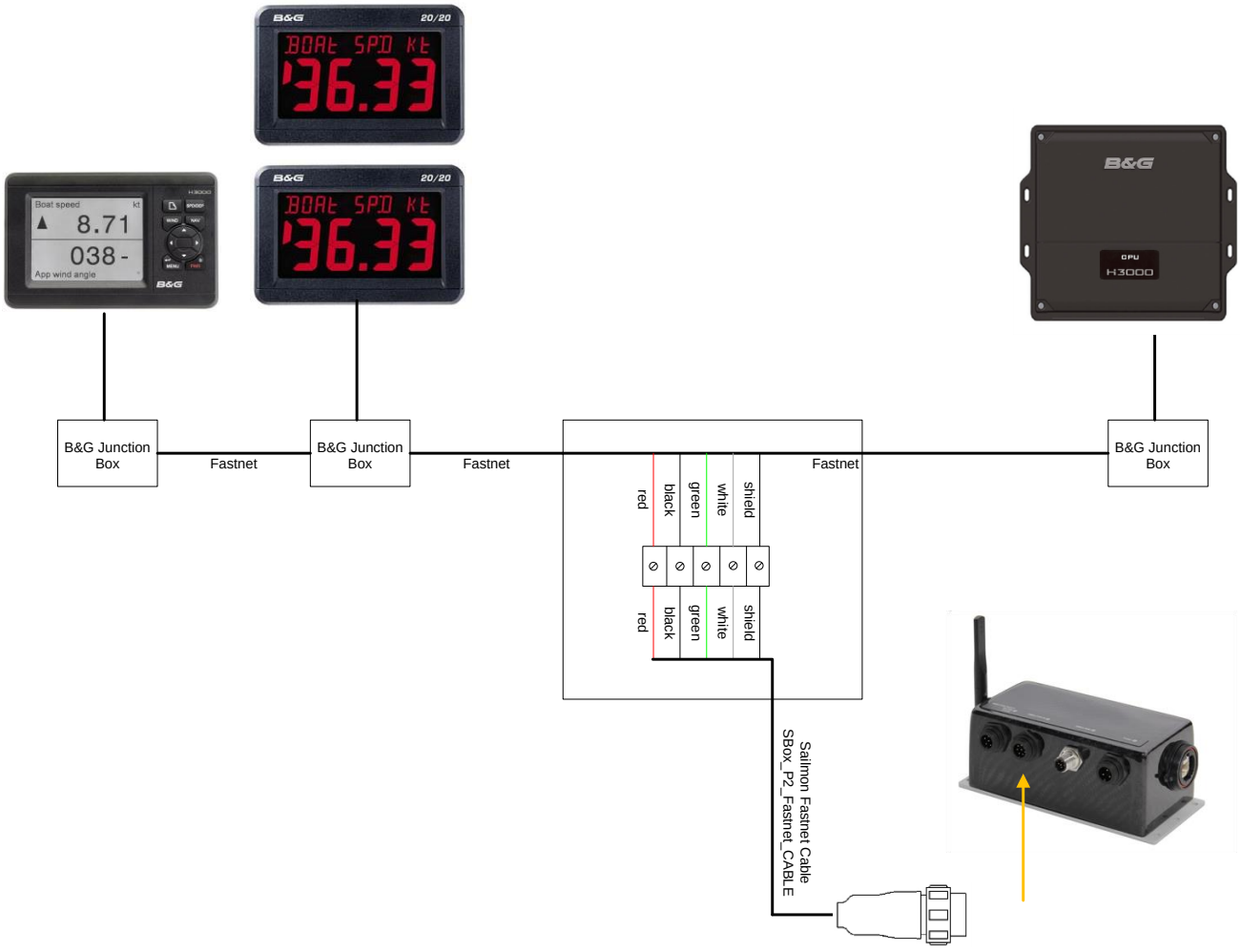
SEE THE NMEA SENTENCE LIST IN

APPENDIX B: SBOX **LP NMEA0183 SENTENCES** FOR FURTHER DETAILS.

B&G H3000 System Fastnet connection

WIRING

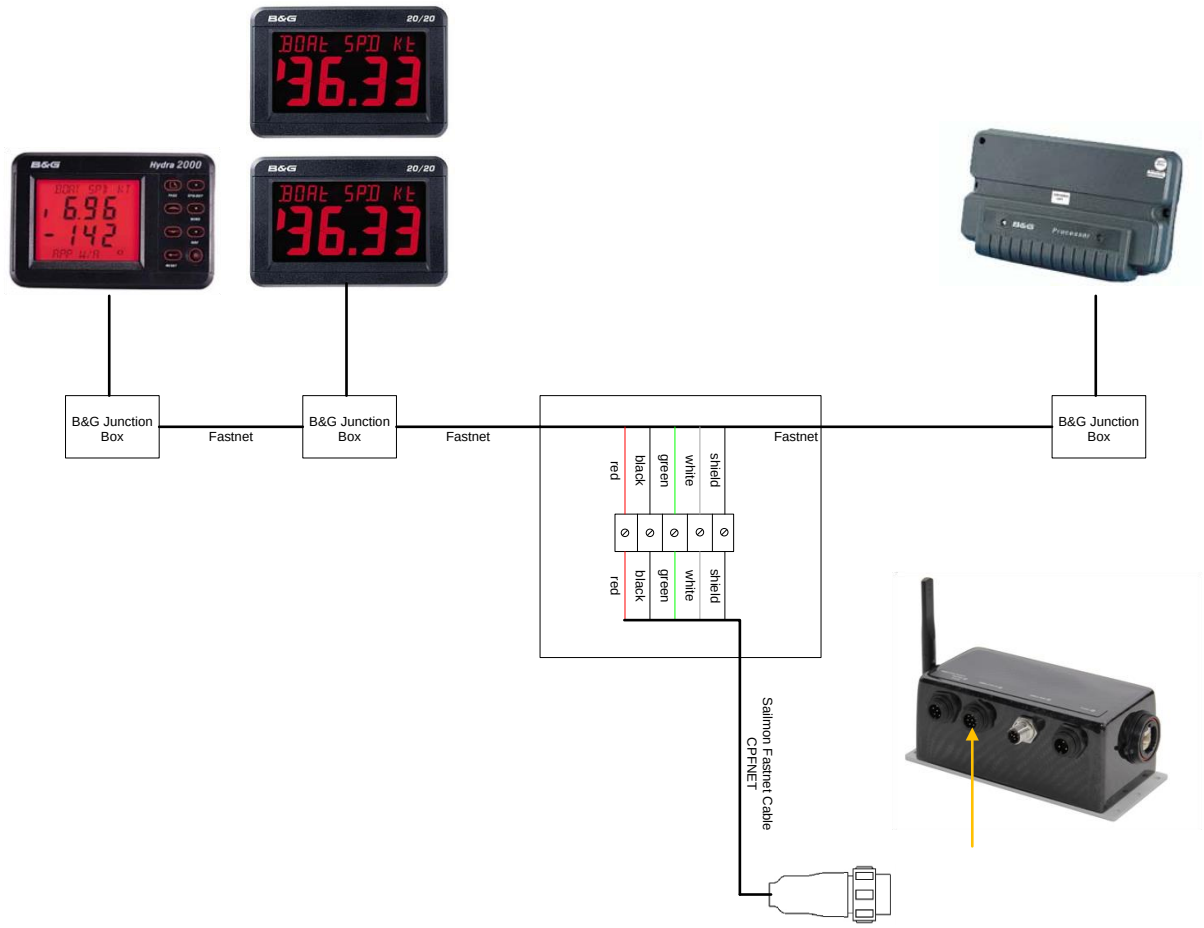
Use the Sailmon Fastnet cable Part Nr: SBox-P2-Fastnet-CABLE for a connection. The Sailmon Fastnet cable connects to Fastnet in a 1:1 manner, so you only connect the wires with the same cable color. You can freely choose the location for the Sailmon cable connection; however, if this connection will be the last point of the Fastnet network, you have to place the B&G termination resistor there. See the B&G handbook for Fastnet installation issues.



Picture 28: Example Fastnet Connection

B&G H2000 System Fastnet connection

WIRING



Picture 29: Example Fastnet Connection

OPTION3: NMEA0183-HS

This option is the same as the standard NMEA0183 mode, except the higher speed. The port is compatible to the NMEA0183-HS specification. Some devices like AIS and multiplexers use this speed option.

The settings are:

Baud Rate [bps]	Data bits	Stop bits	Parity	Handshake
38400	8	1	None (N)	None (N)

Table 7: Port2 interface settings

Sailmon SBox_P2_NMEA0183_Cable color coding:

Cable color	Function
Red	NMEA IN+
Blue	NMEA IN -

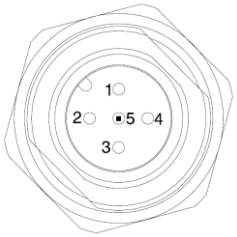
SEE THE NMEA SENTENCE LIST IN

PORT 3: NMEA2000, SEATALK2, SIMNET

Port 3 is an NMEA2000 Rev. 1.2 compatible port. All sensors and networks compatible to the NMEA2000 standard can be connected and will be available in the Sailmon system. This will include: Raymarine Seatalk NG and Seatalk2, Simrad Simnet2, Furuno NMEA2000, Garmin NMEA2000, Maretron…

Sailmon can provide NMEA2000 certified cable sets. Contact Sailmon support in this case.

Technical knowledge is required when installing an NMEA2000 bus.

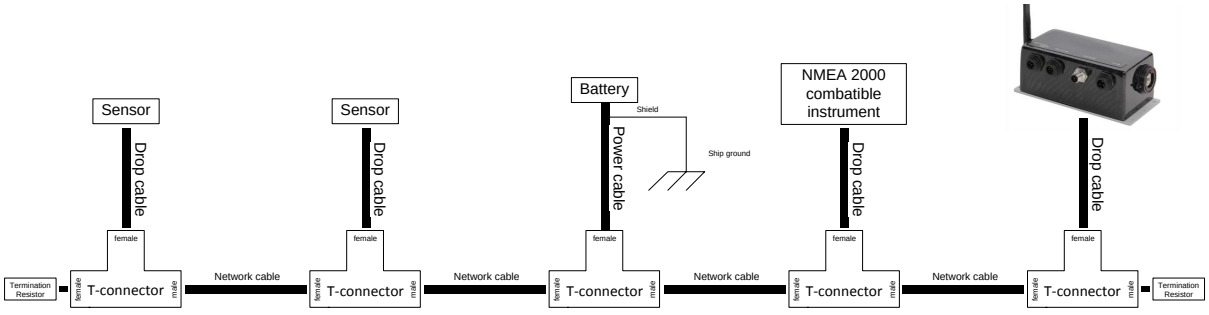


Pin Nr.	Function	Wire color
1	Shield	
2	NET-S (V+)	Red
3	NET-C (V-)	Black
4	NET-H (CAN High)	White
5	NET-L (CAN Low)	Black

Picture 30: Port 3 pins

Basic NMEA 2000 Configuration:

NMEA2000 is a line bus, meaning that there is one cable from one sensor to the next with T-connectors for connecting the sensors See the figure below for details. The cable from the T-connectors to each sensor is called drop cable. The length of such a drop cable must not exceed 6m. Unreliable NMEA2000 operation and difficulties to identify the source of malfunction will result in ignoring the maximum drop cable length. The length of the network cable is basically not limited. However, the total length between the termination resistors typically must not exceed 50m. The limit will usually be the maximum voltage drop between the network power source and the network nodes. (A node is any device on the bus like sensors, an SBox, etc.) At least 9V must be available at every node.



Picture 31: Typical NMEA2000 installation

NMEA2000 is a high-performance network if installation is done properly. Keep the most important facts in mind when installing an NMEA2000 bus:

a) Always use termination resistors on both ends of the bus
b) Never make drop cables longer than 6m

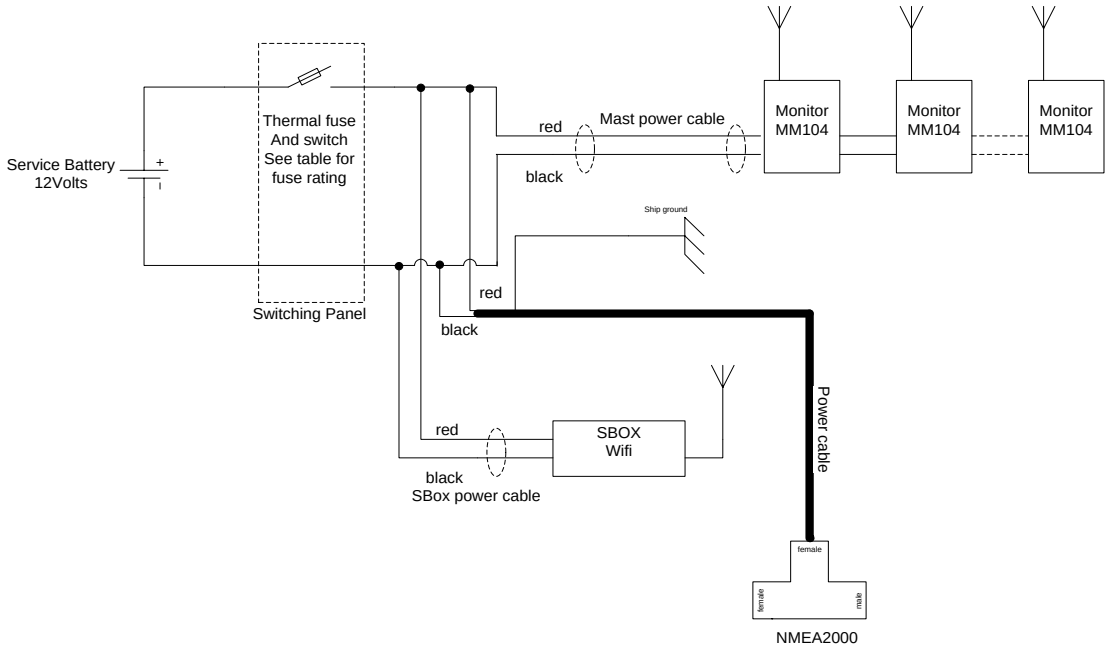
Ask Sailmon for connecting complete busses from other manufactures to the NMEA2000 bus.

CONNECTING THE SBOX LP POWER SUPPLY

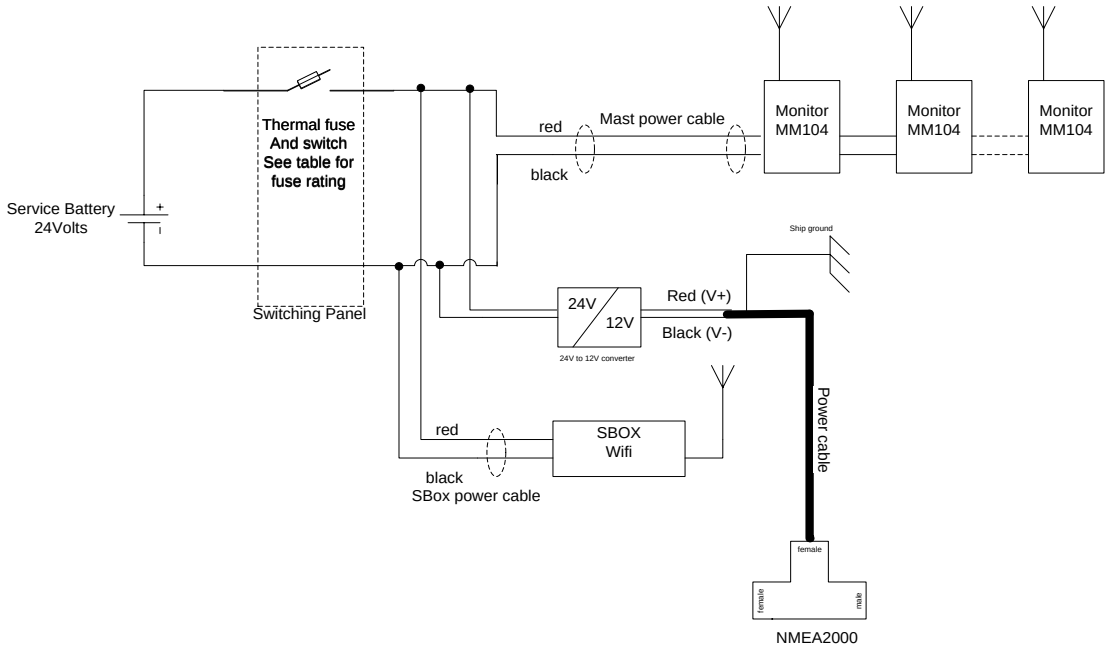
The SBox LP can basically be powered from either 12V or 24V batteries. **However, read below if you intend to connect NMEA2000 to 24V!**

The SBox LP has a 3 pin connector for making a direct connection to your main switching panel. A Power cable is supplied with your SBox Wi-Fi.

NEVER CONNECT THE NMEA 2000 NETWORK POWER CABLE TO A 24V BATTERY SYSTEM. NMEA2000 NODES ARE NOT 24V COMPATIBLE. USE A 24V TO 12V CONVERTER FOR USING NMEA2000 IN A 24V BATTERY SYSTEM. ASK SAILMON SUPPORT IF IN DOUBT.



Picture 32: SBox LP power supply 12V with NMEA2000 connection (no converter necessary)



Picture 33: SBox LP power supply 24V with NMEA2000 connection (24V to 12V converter necessary)

Typical power consumption for the SBox Wi-Fi, without NMEA2000 network load:

Battery voltage	Power	Current
12V	8W	0.7A
24V	8W	0.35A

Table 8: SBox LP power consumption

SBox LP NMEA2000 port power consumption (LEN):

Battery voltage	Power	Current
12V	< 0.6W	< 50mA (1LEN)
24V	**Not allowed**	**Not allowed**

Table 9: NMEA2000 power consumption

If you use a 24V to 12V converter to power the NMEA2000 bus, make sure the converter has enough output capability to supply all NMEA2000 bus nodes. Contact Sailmon support if in doubt.

CHECKING THE INSTALLATION

Double check your installation now. Make sure the monitors and the SBox LP are connected to the battery, all bus connections are done well and the antennas are mounted on the SBox Wi-Fi. Cables must never touch the SBox LP carbon housing.

FIRST POWER ON

SWITCHING POWER

Switch-on the power to the power to the Sailmon system. Immediately check the current consumption of the system with your ships ampere meter.

A typical installation will consume (without sensors, NMEA2000, with full brightness):

Number of Monitors	Typical Current consumption 12V	Typical Current consumption 24V
1	1.4A	0.8
2	2.4A	1.2A
3	3.5A	1.8A
4	4.5A	2.3A
5	5.5A	2.3A
6	6.5A	3.3A

Table 10: Typical system power consumption

Make sure the blue power LED of the SBox LP is on.

Make sure the monitors boot up and show the Sailmon logo and finally show sensor data or “no data”.

PAIRING OF THE MM104 INSTRUMENT

It is not necessary to pair the MM104 instruments if you use them with the powerline data communication. Only in the rare case where powerline communication is not possible, the instruments need to be paired!

Paining is done with the Sailmon pairing stick. This device can be ordered on request, it is dedicated to your Sbox.

Pairing process: To pair a MM104LP device to your SBox, switch on the MM104 instrument and wait until the boot process is finished. Then, connect the pairing stick for at least 10 seconds to the blue connector of the MM104. Disconnect the pairing stick. That’s all, your MM104 is paired now!

CHECK THE INTERFACES

Every port on the SBox LP has a blue LED to show valid data reception. Check if the interface you use has the LED light up when powering on the data source.

WIRELESS SAILMON NETWORK

The Sailmon wireless network is a high performance network with very robust data transmission and state-of-the-art data security.

Sbox Wifi parameters:

Communication Standard	802.11b/g, with auto rate select, all rates supported
Wireless Security	WPA2/PSK with secure password
Network Topology	Infrastructure Mode
Access Point	SBox Wi-Fi
Tranmission Power	MM104, SBox Wi-Fi: +20dbm (100mW)
Communication Frequency	2414MHz – 2462MHz
802.11b/g Channel Selection	Automatic, Only international channels 1-11 are enabled

You can connect to the Sailmon network with every 802.11a/b/g/n enabled device. These devices can be your laptop, a handheld PC for tactic software, your board PC, iPad, iPhone, iPod or others.

The network topology is “infrastructure mode”, meaning that there is a central device (access point) which controls all the communication in the network. This access point is included in the SBox LP. **Therefore the SBox LP has to be powerd on all times you use any of the Sailmon wireless devices.**

Multiple Sailmon networks from ships nearby do not interfere with your network. Automatic channel selection and transmission power adjustment will ensure a reliable network operation.

To connect to the Sailmon network, use the network settings which are printed on the backside of the SBox LP. **Wi-Fi ID and Password are case sensitive!**

Wi-Fi ID: This is the Sailmon network name for your ship. This is the name which is displayed when you connect to the network.

Wi-Fi PW: This is the password you need to connect to the Sailmon network.

Both Wi-Fi ID and Wi-Fi password are unique for every ship and can only be changed in case of product replacement from an authorised dealer.

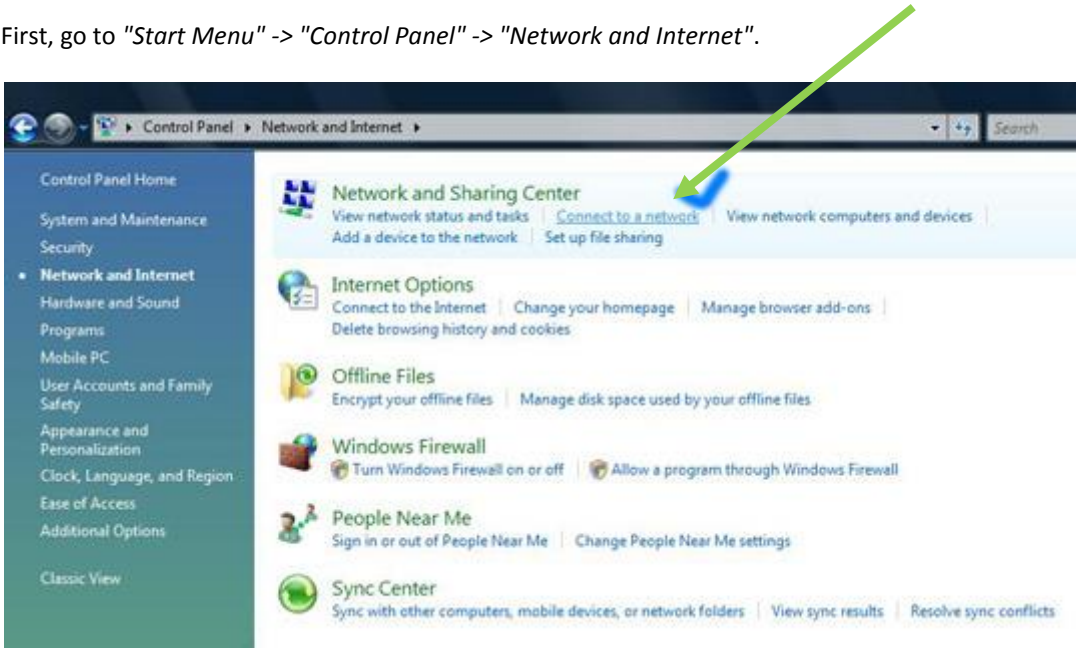
Beware that connection problems might arise when reading an I (India) for an l (Lima).

PC OR LAPTOP CONNECTION

To connect your laptop to the Sailmon network you need a computer with a Wi-Fi interface which is 802.11a/b/g/n compatible Most modern laptops will have such an interface included.

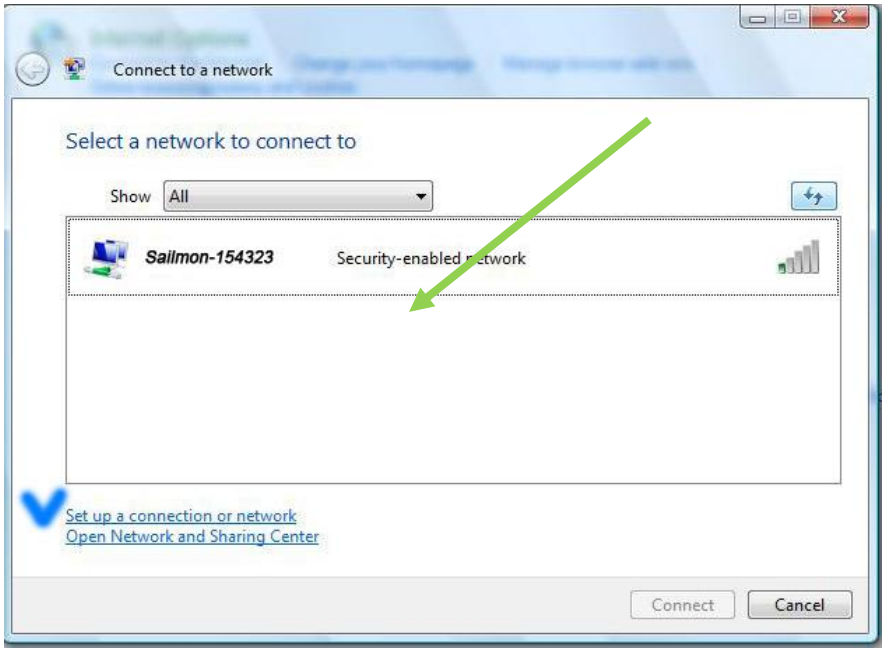
Depending on your operating system the following screens might be different.

First, go to *"Start Menu" -> "Control Panel" -> "Network and Internet"*.



Go to *"Network and Sharing Center"* and select *"Connect to a network"*, like it is shown in the screenshot above.

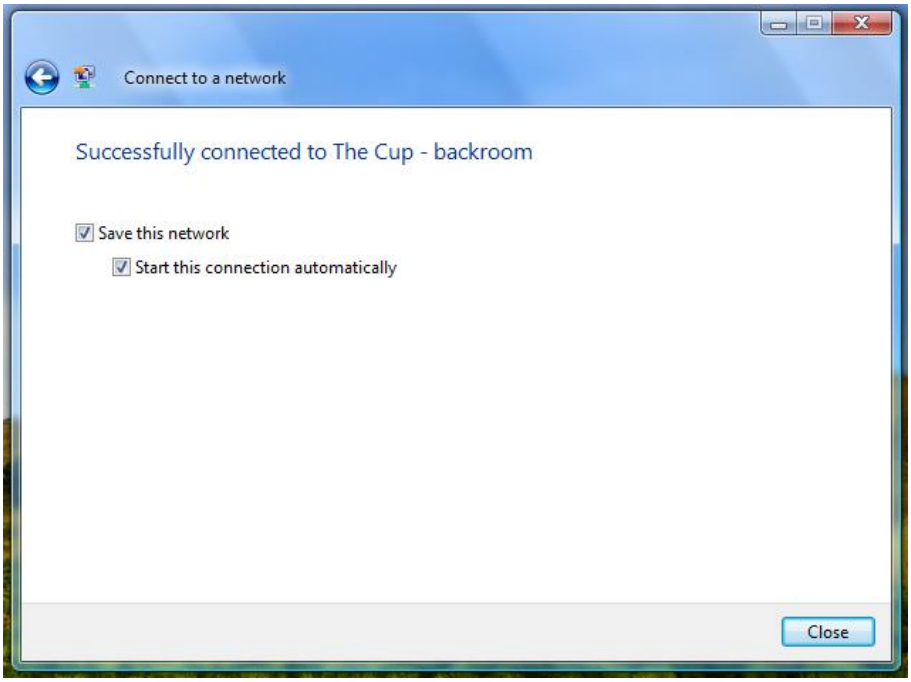
Select sailmon-xxxxx as from you SBox W-Fi type label.



Enter the password as from you SBox W-Fi type label.

Connect to a network
Type the network security key or passphrase for Sailmon-154323
The person who setup the network can give you the key or passphrase.
Security key or passphrase:
Display characters
If you have a USB flash drive with network settings for , insert it now.
Connect
Cancel

Do not forget to check “Save this network” and “Start this connection automatically”.



Your PC will now automatically connect to Sailmon if the system is powered on.

There might be problems when more than one network is connected at a time. Avoid connecting to other networks while working with the Sailmon system if you experience troubles.

LAUNCHING THE SAILMON TOOL

To start the Sailmon PC Tool click on *Start->Programs->Sailmon->Sailmon Tool* or double click the Sailmon Tool icon. Make sure you are connected to the Sailmon wireless network **before** starting the PC Tool. See PC or laptop on page 63 on how to connect to the wireless network.

If your windows firewall is enabled, you might be asked to enable network connections. Choose “Unblock” to enable communication between the Sailmon PC Tool and the Sailmon system.

Windows Security Alert
Windows Firewall has blocked some features of this program
Windows Firewall has blocked this program from accepting incoming network connections. If you unblock this program, it will be unblocked on all private networks that you connect to. What are the risks of unblocking a program?
Name: sailmontool.exe
Publisher: Unknown
Path: C:\xampp\mysql\bin\mysqld.exe
Network location: Private network
What are network locations?
Keep blocking
Unblock

THE SAILMON PC TOOL MAIN WINDOW

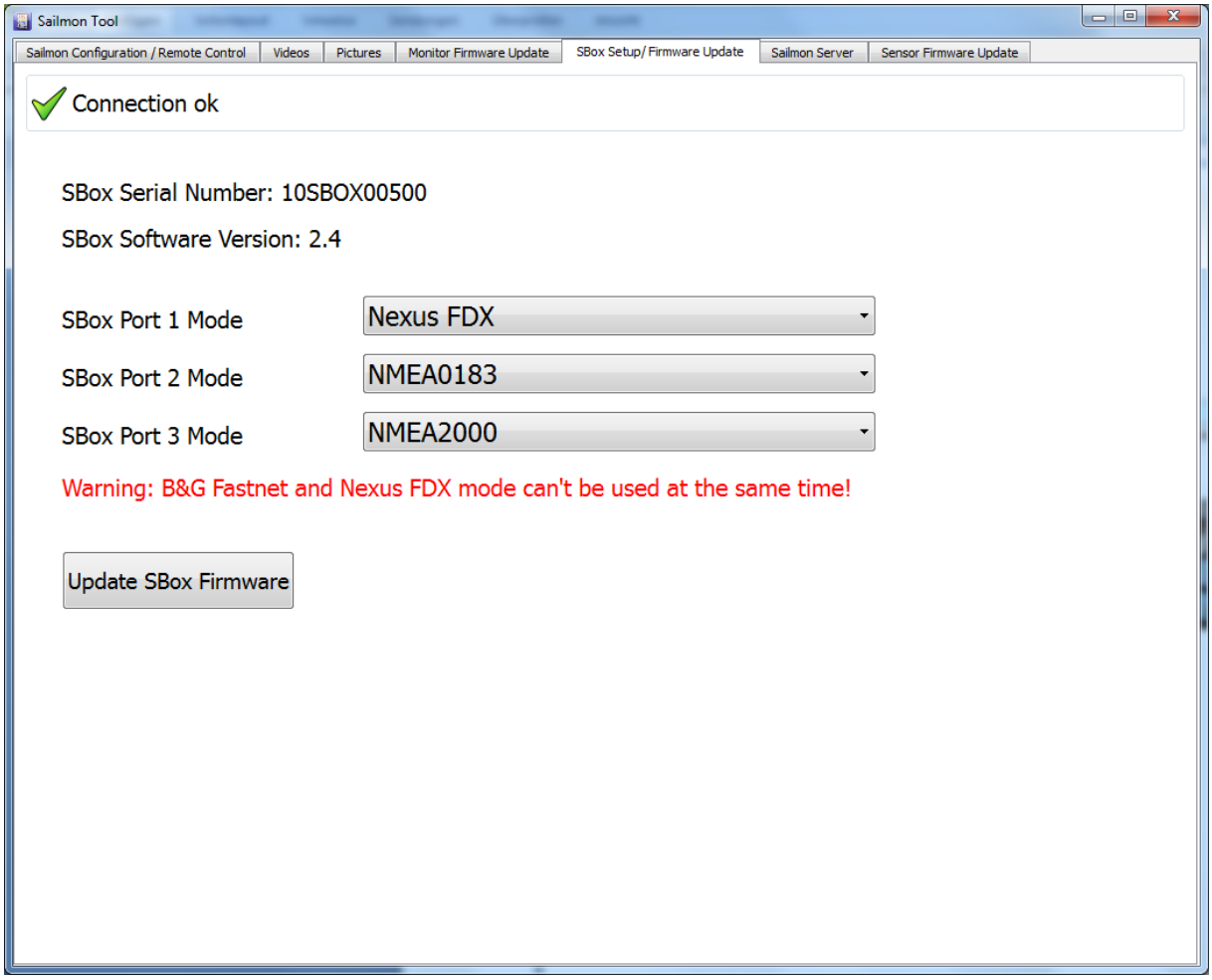
Make sure the connection status line is green and shows “Connection ok” before you start working with the Sailmon system.

There might be troubles with the connection if you are connected to multiple networks on your PC. Try to close the connection to the Sailmon wireless network and reopen it again if you experience connection problems. Also, enabled firewall software might refuse a connection to the Sailmon system. Disable the firewall and restart the Sailmon Tool if necessary.

SET SBOX INTERFACE PARAMETERS

Depending on the actual SBox sensor connections, it is absolutely necessary to set the SBox ports into the right mode. To do so, you will need the Sailmon Software Pack installed on your PC. (See separate manual for the installation)

Within the Sailmon Tool go to the “SBox Setup / Firmware update” tab:



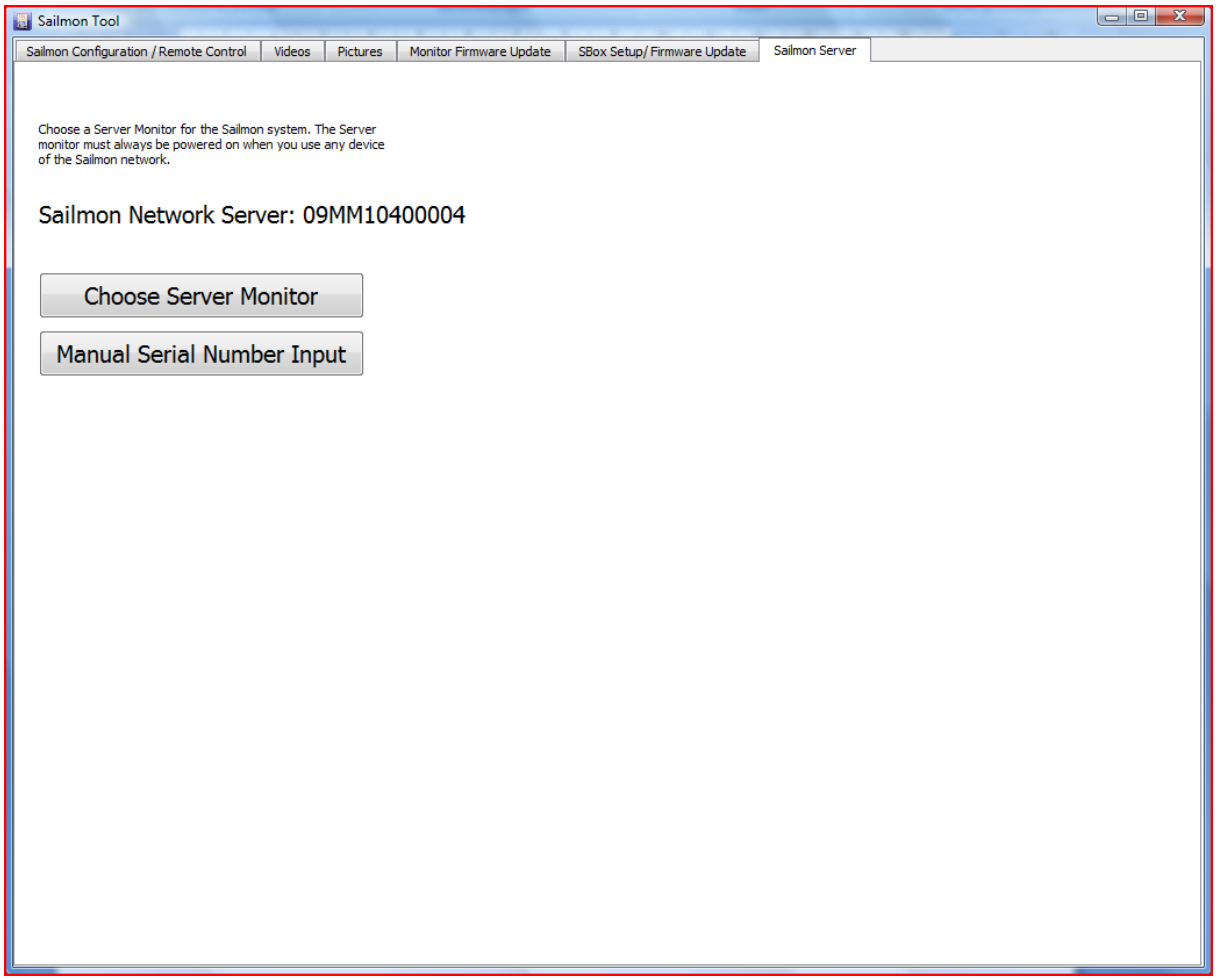
Select the 3 ports according to the physically connected bus.

After the selection, take a look at your SBox. The connection is fine as soon the blue LED on the Sbox is on!

SELECTING A SAILMON SERVER

Every Sailmon instrument system needs one monitor to be server. This device does the management of the complete instrumention. The server has to be set one time, but can also be changed later on.

To select a Sailmon Server, choose the “Sailmon Server” tab. See Sailmon system considerations on page 32 for details on server selection.


Sailmon Tool
Sailmon Configuration / Remote Control
Videos
Pictures
Monitor Firmware Update
SBox Setup/ Firmware Update
Sailmon Server
Choose a Server Monitor for the Sailmon system. The Server monitor must always be powered on when you use any device of the Sailmon network.
Sailmon Network Server: 09MM10400004
Choose Server Monitor
Manual Serial Number Input

You will be informed about the current server monitor. Select” Choose Server Monitor” to get a list of available servers, or “Manual Serial Number input” to set a server which is currently not powered on.

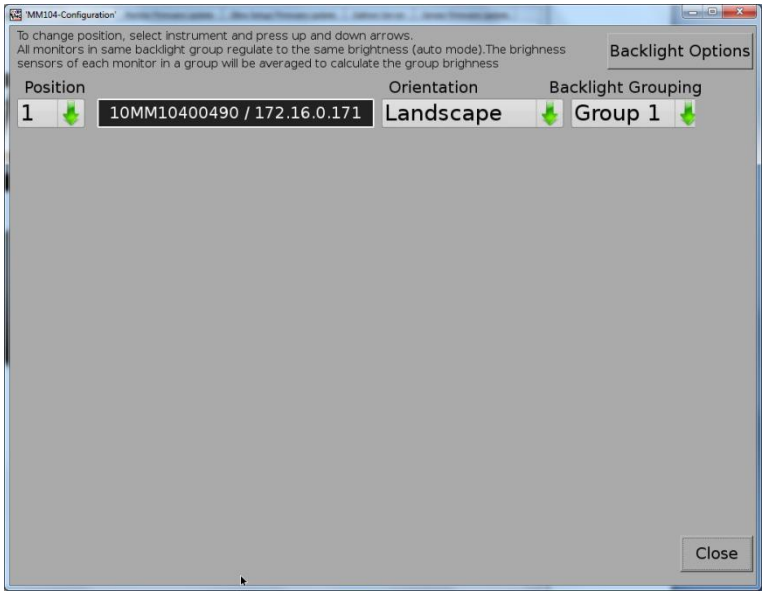
If no monitor appears in the list you most likely did not pair the MM104 instruments sucessfully. Painring needs to be done before this step.

SETTING THE MONITOR POSITIONS

Every monitor has a unique position. This means you should give the monitors useful numbers to recognize them during setup and configuration. As soon as you connected you PC to the Sailmon network, open the Sailmon Tool.

Click on the red Config Tool button on the main tab “Sailmon Configuration / Remote control”.

Select “Setup” to enter the MM104 setup.


To change position, select instrument and press up and down arrows.
All monitors in same backlight group regulate to the same brightness (auto mode).The brighness sensors of each monitor in a group will be averaged to calculate the group brighness
Backlight Options
Position
Orientation
Backlight Grouping
1
10MM10400490 / 172.16.0.171
Landscape
Group 1
Close

You will see all available instruments. To change an instrument position, click on the respective instrument and use the up and down menu to change the position. Assign a unique number to all instruments!

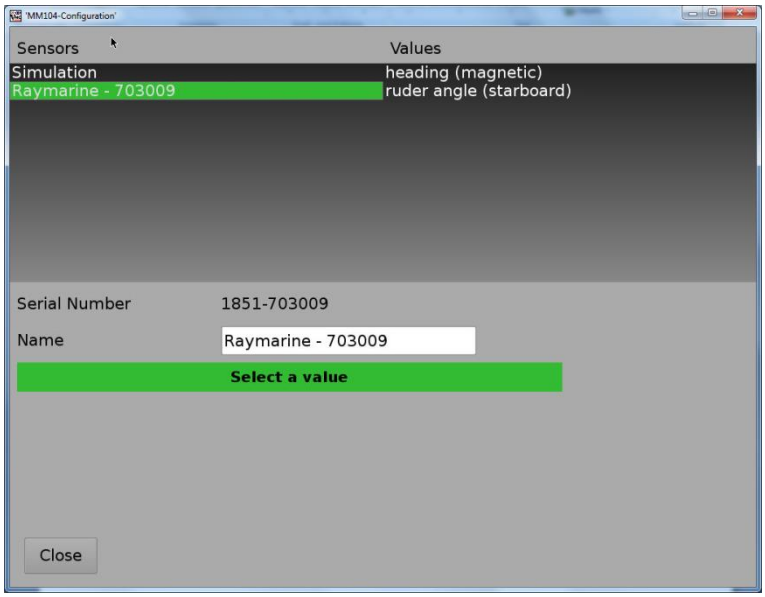
Orientation: Select the instrument orientation to be either landscape or portrait mode

Backlight Grouping: In systems with a certain number of MM104 instruments you might want to group monitors so they have the same backlight. All monitors within the same group will be regulated to the same backlight level to achieve brightness uniformity. (All backlight sensor levels of the respective group are averaged)

CHECK THE SENSOR INSTALLATION

Sailmon has a very powerful diagnostic system where all sensors can be checked for proper operation.

Click the “Diagnostis” button.



You see a list of currently connected sensors. Click on the sensor to see which values it delivers. Click on the value to get a preview of the raw sensor value.

You can change the Sensors name in the “NAME” field. This will allow an alternative name for this sensor. The name will be visible within the calibration.

THE DIAGNOSIS WINDOW SHOWS EVERY VALUE THE RESPECTIVE SENSOR DELIVERES AT THE MOMENT. VALUES WHICH HAVE BEEN DELIVERED BY THIS SENSOR BUT WHICH ARE NOT DELIVERED AT THE MOMENT ARE SHADED TO GRAY.

CONFIGURING OF THE SENSORS

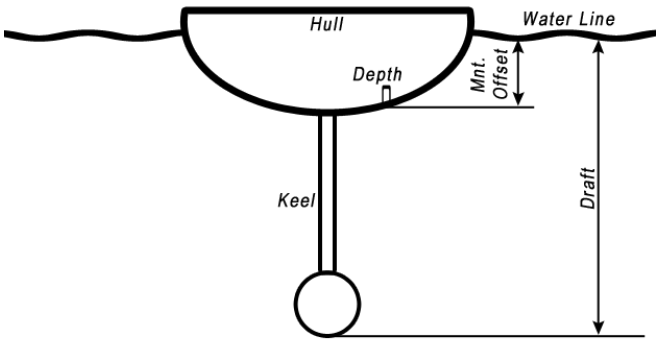
Configuring the sensors is a straight forward process. Since Sailmon allows connection of multiple sensors delivering the same data, it is necessary to do some configuration to take full advantage of the Sailmon system.

The software will automatically try to select the sensors. This will work if you have only one sensor of a specific data value connected. (For example: you have just one wind sensor connected, delivering apparent wind speed and angle)

IN THIS SECTION WE WILL DESCRIBE THE SENSOR SELECTION PROCESS DURING INSTALLATION. REFER TO THE SAILMON CALIBRATION MANUAL FOR MORE DETAILED INFORMATION.

You will have to manually select the correct sensor if you have installed more than one sensor of the same kind.

Click the “Calibration” button.



Picture 34: Depth sensor parameters

Depth values from existing instrument systems: A special case occurs, when the source of your depth data comes out of an existing instrument system like B&G Fastnet or Raymarine SeaTalk. In this case the existing instrument system delivers a calibrated value instead of the raw sensor data. (The user can set offset values)

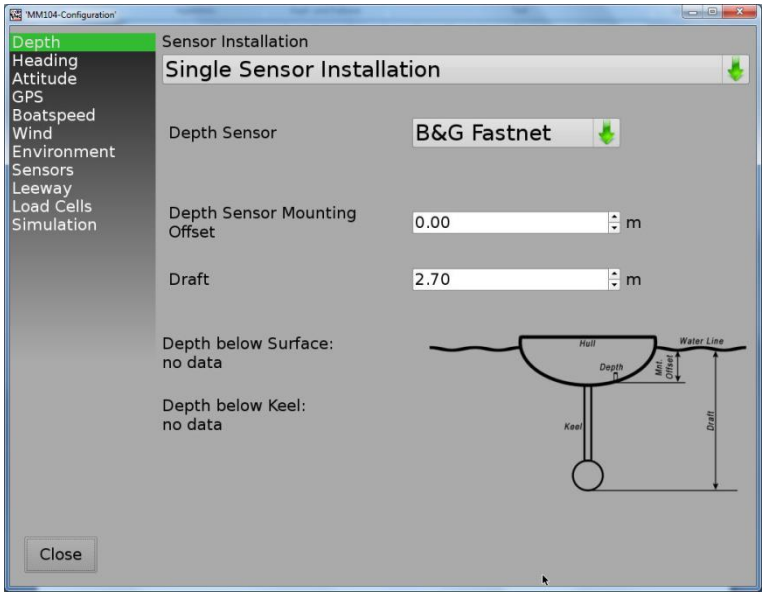
Follow the rules below to get correct readings for both “Depth below Surface” and “Depth below Keel” values:

- Case 1: The depth offset of the existing instrument is set to show the surface depth (offset is positive):
  - In the Sailmon Depth calibration window, set the **“Mounting offset” to 0.0.**
- Case 2: The depth offset of the existing instrument is set to show the depth below keel(offset is negative):
  - In the Sailmon Depth calibration window, set the “Mounting offset” to be **Draft - Raymarine depth offset value**

Always set the correct draft of your ship in the “Draft” field of the Sailmon Calibration window.

SINGLE SENSOR INSTALLATION

Use this option if you have one single depth sensor connected to your instruments.



Step 1: Select “Single Sensor installation”

Step 2: Select your depth sensor from the dropdown list. All available sensors can be selected. Make sure you choose the right one if you have more than one depth sensor installed.

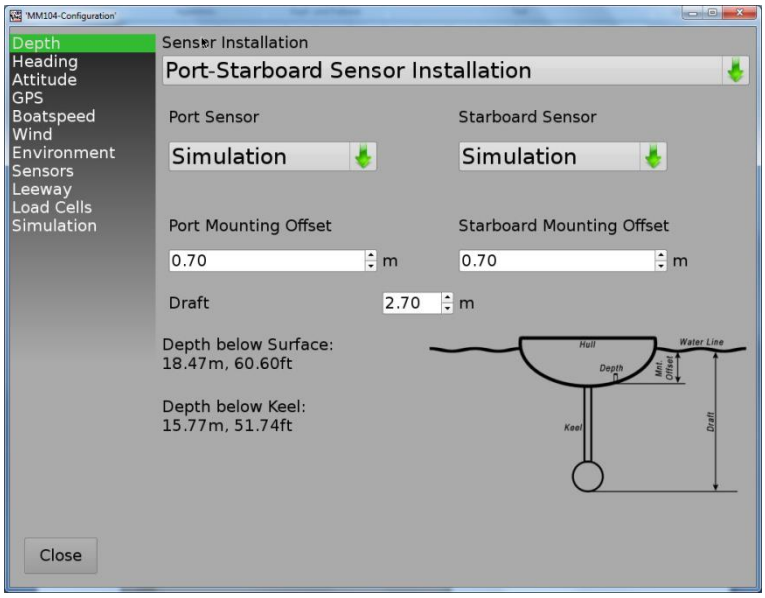
Step 3: Enter your depth sensor mounting offset. This is the distance in meters from the water surface to the depth sensor location. See the drawing above. If connected to an existing instrument system, read carefully the instructions above! Please note, unlike in other instrument systems, the sensor mounting offset is always a positive number.

Step 4: Enter your yachts draft.

Sailmon can calculate depth below surface and depth below keel as soon all these parameters are set.

DUAL SENSOR INSTALLATION

Use this option if you have one depth sensor on port side and one on starboard side. Sailmon provides automatic heeling switchover to select the right sensor in all cases. (If no heeling sensor is provided, the current wind angle will be taken to discover the boats heeling direction)



Step 1: Select “Port-Starboard Sensor installation”

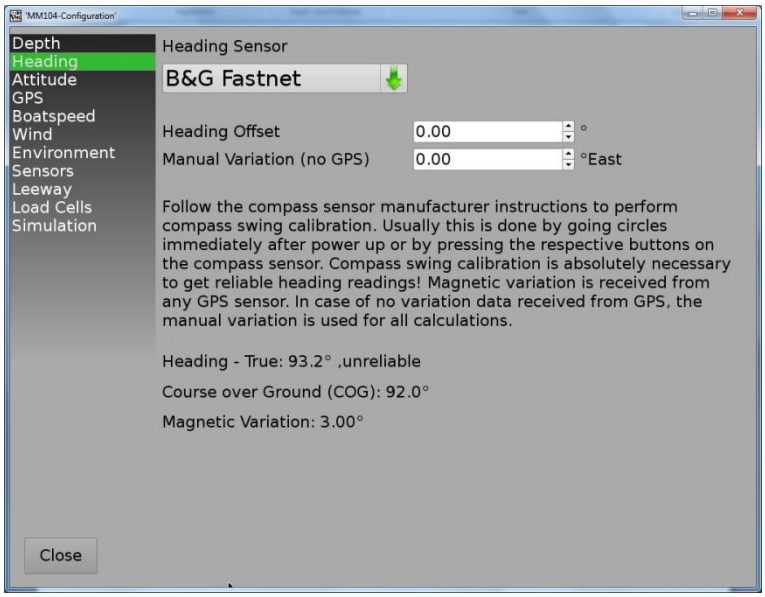
Step 2: Select your depth sensor for both sides from the dropdown list. All available sensors can be selected. Make sure you choose the right one if you have more than one depth sensor installed.

Step 3: Enter your depth sensor mounting offset for both sensors. This is the distance in meters from the water surface to the depth sensor location. See the drawing above. If connected to an existing instrument system, read carefully the instructions above! Please note, unlike in other instrument systems, the sensor mounting offset is always a positive number.

Step 4: Enter your yachts draft.

Sailmon can calculate depth below surface and depth below keel as soon all these parameters are set.

HEADING SENSOR SELECTION


'MM104-Configuration'
Depth
Heading
Attitude
GPS
Boatspeed
Wind
Environment
Sensors
Leeway
Load Cells
Simulation
Heading Sensor
B&G Fastnet
Heading Offset
0.00
°
Manual Variation (no GPS)
0.00
°East
Follow the compass sensor manufacturer instructions to perform compass swing calibration. Usually this is done by going circles immediately after power up or by pressing the respective buttons on the compass sensor. Compass swing calibration is absolutely necessary to get reliable heading readings! Magnetic variation is received from any GPS sensor. In case of no variation data received from GPS, the manual variation is used for all calculations.
Heading - True: 93.2° ,unreliable
Course over Ground (COG): 92.0°
Magnetic Variation: 3.00°
Close

Step 1: Select the heading sensor out of the list. Make sure you choose the right one if you have more than one heading sensor connected.

Step 2: Follow the compass sensors manufacturer's instructions for compass swing calibration. Usually you have to turn circles with the yacht. Don't go to step 3 before you did the compass swing calibration.

Step 3: Choose the Heading offset. This is the horizontal alignment of the compass due to the mechanical installation.

Step 4: Choose a manual variation in case the GPS sensor does not provide magnetic variation data.

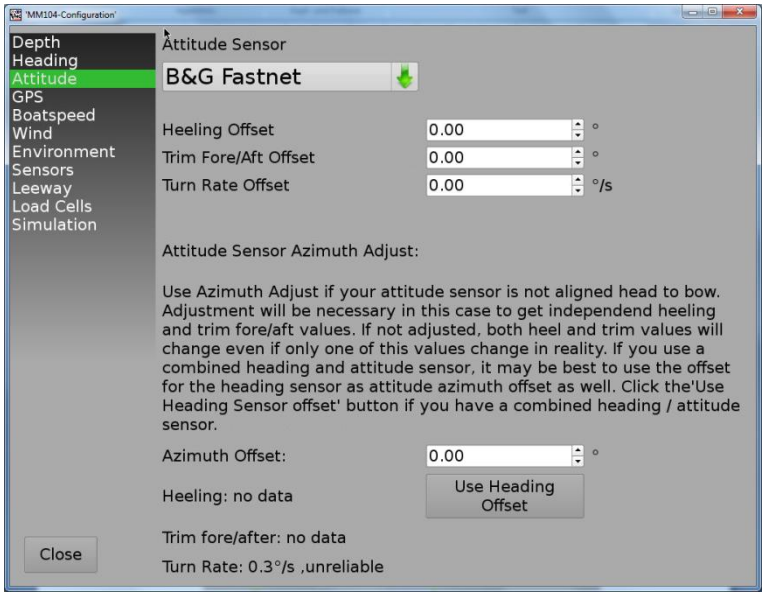
ALWAYS SELECT THE MANUAL VARIATION TO THE SHIPS CURRENT LOCATION. SEE THE LATEST CHARTS TO GET THE VARIATION NUMBER

ATTITUDE SENSOR SELECTION

Use the attitude sensor selection if you have a heeling and trim sensor installed.

Heeling: Negative heeling values mean that the boat is heeling to the port side

Trim: Negative trim values means that the boat's bow is lower than the stern


'MM104-Configuration'
Depth
Heading
Attitude
GPS
Boatspeed
Wind
Environment
Sensors
Leeway
Load Cells
Simulation
Attitude Sensor
B&G Fastnet
Heeling Offset
0.00
°
Trim Fore/Aft Offset
0.00
°
Turn Rate Offset
0.00
°/s
Attitude Sensor Azimuth Adjust:
Use Azimuth Adjust if your attitude sensor is not aligned head to bow. Adjustment will be necessary in this case to get independend heeling and trim fore/aft values. If not adjusted, both heel and trim values will change even if only one of this values change in reality. If you use a combined heading and attitude sensor, it may be best to use the offset for the heading sensor as attitude azimuth offset as well. Click the'Use Heading Sensor offset' button if you have a combined heading / attitude sensor.
Azimuth Offset:
0.00
°
Heeling: no data
Use Heading Offset
Trim fore/after: no data
Turn Rate: 0.3°/s ,unreliable
Close

Step 1: Select the attitude sensor out of the list. Make sure you choose the right one if you have more than one attitude sensor connected.

Step 2: In case your attitude sensor is not installed correctly head to bow, use the azimuth adjustment to re-orientate the sensor. In case you have a combined compass and attitude sensor, you can get the compass offset value by pressing the "Use heading offset" button.

Step 2: Select the heeling offset in a way that the preview data shows zero degrees as soon the boat is perfectly even (port – starboard side)

Step 3: Select the trim offset in a way that the preview data shows zero degrees as soon the boat is perfectly even (bow - stern)

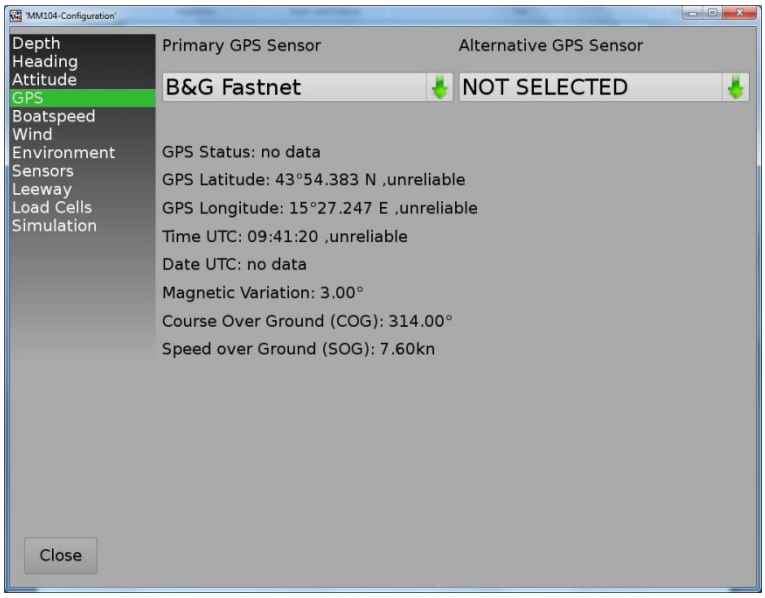
Step 4: Check if the heeling value gets negative as soon the boat heels to port and positive when the boat heels to starboard. Check the sensor mounting orientation if wrong, or use the azimuth adjustment described below.

Step 5: Check if the trim value gets negative as you lower the boats bow, and positive when the boat boat's bow is raised. Check the sensor mounting orientation if wrong, or use the azimuth adjustment described below.

Step 6: If you have a turnrate sensor, you can provide an offset to the turnrate in case the turnrate is not equal zero when the boat is stable. Please beware that some turnrate sensors have to be switched on for a certain time before their value gets stable.

GPS SENSOR SELECTION

Select a GPS sensor for the Sailmon instruments. For ultimate reliability, a primary and an alternative sensor can be selected. In case of primary sensor failure, the system automatically switches over to the alternative sensor.



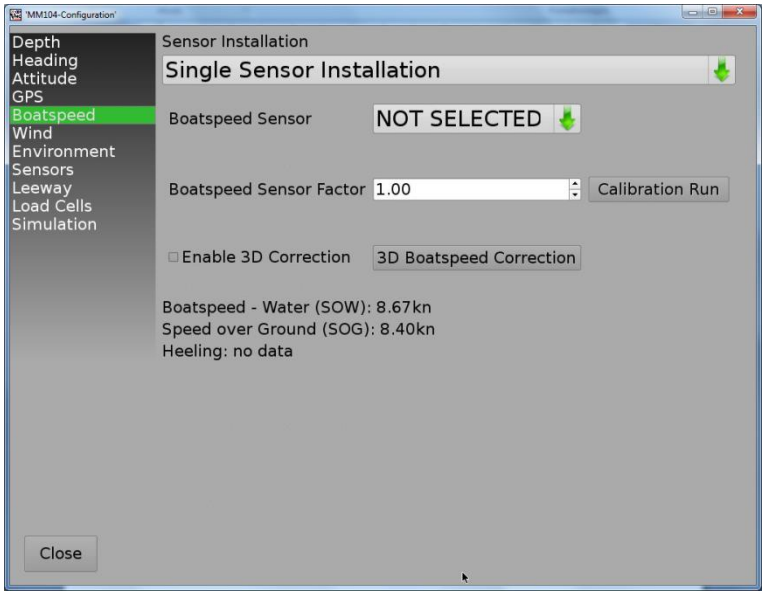
GPS SENSOR SELECTION IS ESSENTIAL TO THE SAILMON INSTRUMENTS. PREFER GPS SENSORS WITH AN UPDATE RATE OF AT LEAST 5HZ TO GET THE MOST OUT OF SAILMON!

BOATSPEED SENSOR SELECTION

Use the boatspeed calibration tab to select your boatspeed sensors. In this manual it is shown how to set the sensors, please refer to the Sailmon calibration manual for advanced boatspeed calibration!

SINGLE SENSOR INSTALLATION

Use this option if you have a single boatspeed sensor installed.



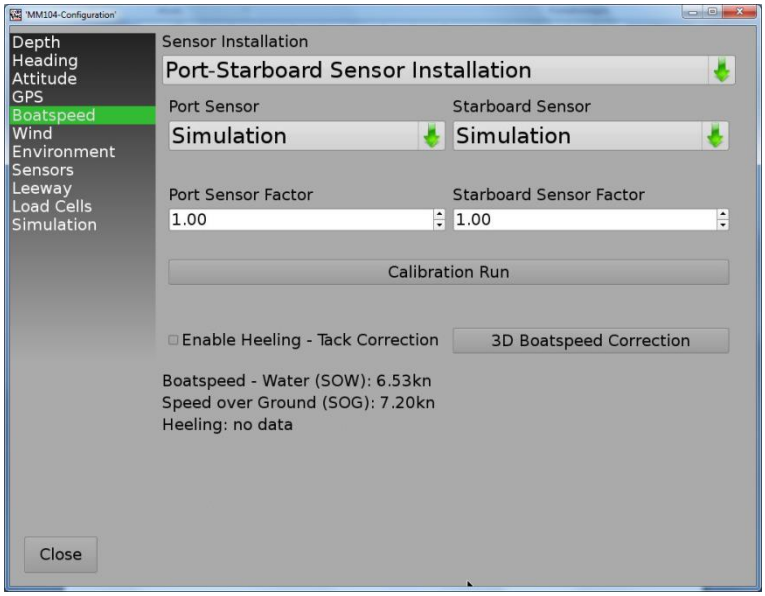
Step 1: Chooese “Single Sensor Installation” from the sensor installation tab.

Step 2: Choose your boatspeed sensor. Make sure you choose the right one if more than one boatspeed sensor is installed!

Step 3: During calibration refer to the Sailmon calibration manual on how to accurately calibrate boatspeed

DUAL SENSOR INSTALLATION

Use this option if you have 2 boatspeed sensor installed, one on port and one on starboard.



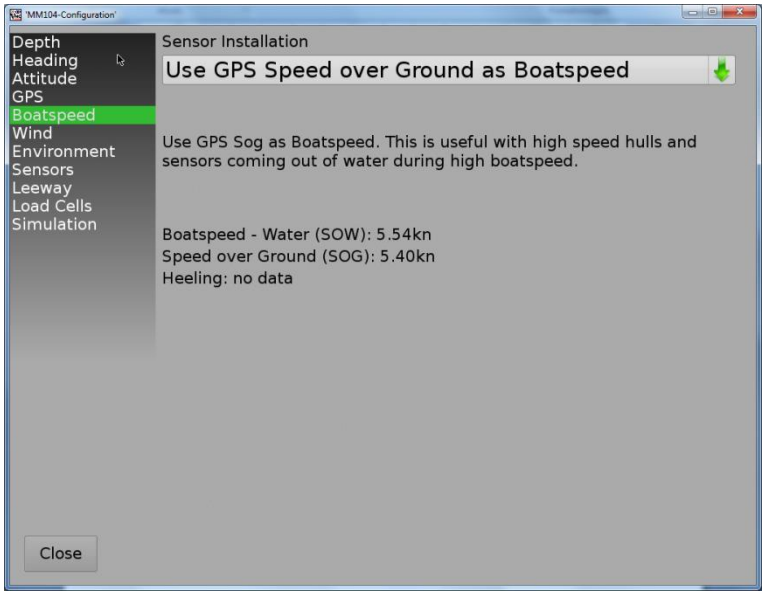
Step 1: Chooese “Port - Starboard Sensor Installation” from the sensor installation tab.

Step 2: Choose your boatspeed sensors. Make sure you choose the right ones if more than one boatspeed sensor is installed!

Step 3: During calibration refer to the Sailmon calibration manual on how to accurately calibrate boatspeed

USE GPS SOG AS BOATSPEED

Use this option if you want to use the GPS sensor speed as your boatspeed. (Refer to the Sailmon calibration manual for details)



Step 1: Choose “Use GPS Speed over Ground as Boatspeed” from the sensor installation tab.

WIND SENSOR SELECTION

Use the wind sensor tab to select your wind sensors. In this manual it is shown how to set the sensors, please refer to the Sailmon calibration manual for wind calibration!

Step 1: Select your wind mast head unit sensor (MHU)

Step 2: Select your deck wind sensor. Leave as “not selected” if you don’t have one.

Step 3: Select your mast rotation sensor. Leave as “not selected” if you don’t have one.

Step 4: During calibration, refer to the Sailmon calibration manual for details

ENVIRONMENT SENSOR SELECTION

Use the environment sensor tab to select your environment sensors.

For all sensors: Set to “not selected” if you don’t have the respective sensor installed!

Step 1: Select your water temperature sensor

Step 2: Select your air temperature sensor

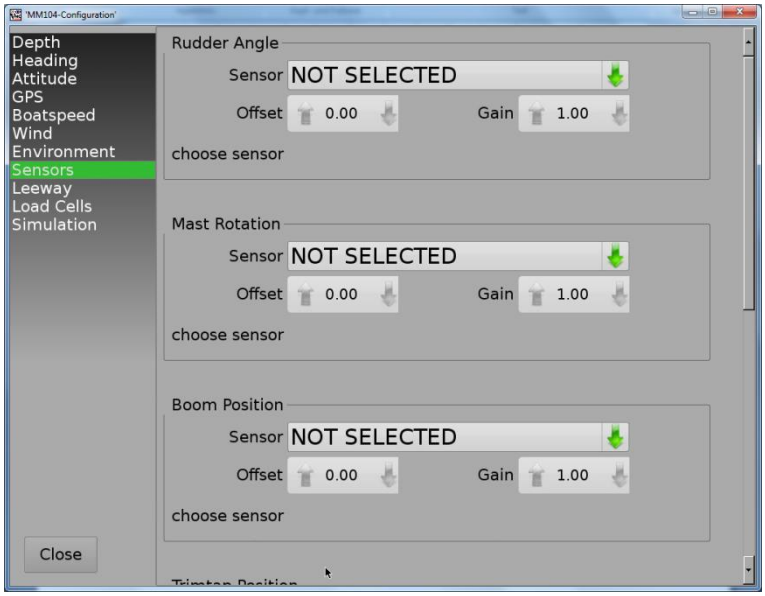
Step 3: Select your humidity temperature sensor

Step 4: Select your barometric pressure sensor

See the Sailmon calibration manual for details on environment sensor calibration

FURHTER SENSOR SELECTION

Use the sensor tab to select your additional sensors.



For all sensors: Set to “not selected” if you don’t have the respective sensor installed!

Step 1: Select your rudder angle sensor

Step 2: Select your mast rotation sensor

Step 3: Select your boom opsition sensor

Step 4: Select your trimtab position sensor

Step 5: Select your canard angle sensor

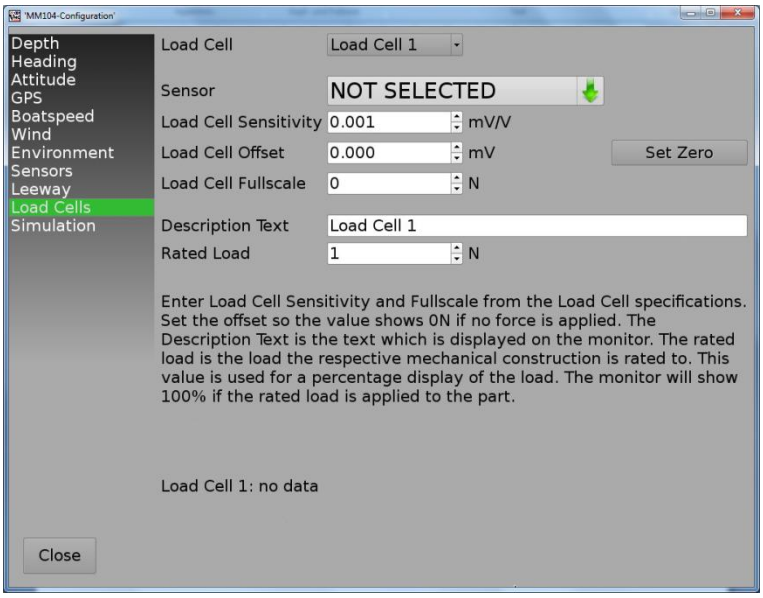
Step 6: Select your daggerboard position sensor

See the Sailmon calibration manual for details on environment sensor calibration

LOADCELL SENSOR SELECTION

Use the loadcell tab to select your loadcells.

Only Loadcells connected over a Sailmon loadcell box can be selected in this tab.



For all sensors: Set to “not selected” if you don’t have the respective sensor installed!

Step 1: Select which loadcell you want to set the sensor. Maximum 16 loadcells can be connected.

Step 2: Select the loadcell. Make sure you choose the right one if you have more than one loadcell installed.

Step 3: From the type label of the loadcell, get the following values: Sensitivity, Fullscale load.

Step 4: Enter sensitivity and fullscale

Step 5: release all load from the loadcell and press the “Set zero” button

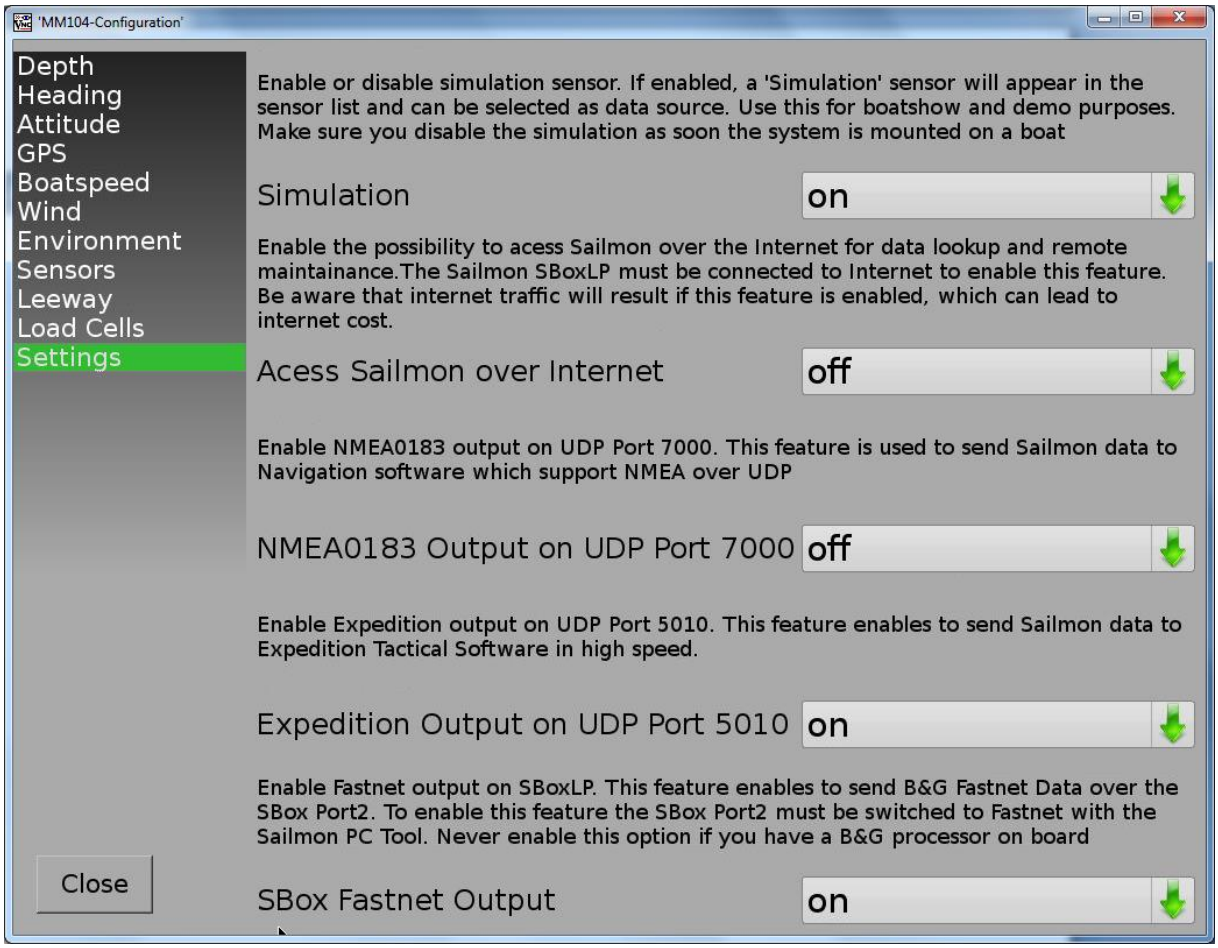
Step 6: Select a name for this loadcell. This name will be displayed on the Sailmon instruments then

Step 7: Set the rated load of the device where the loadcell is installed. This allows a percentual display of the load

Step 8: repeat all steps for any furhter loadcell installed.

See the Sailmon calibration manual for details on loadcell calibration

Appendix A: Settings


'MM104-Configuration'
Depth
Heading
Attitude
GPS
Boatspeed
Wind
Environment
Sensors
Leeway
Load Cells
Settings
Close
Enable or disable simulation sensor. If enabled, a 'Simulation' sensor will appear in the sensor list and can be selected as data source. Use this for boatshow and demo purposes. Make sure you disable the simulation as soon the system is mounted on a boat
Simulation
on
Enable the possibility to acess Sailmon over the Internet for data lookup and remote maintainance.The Sailmon SBoxLP must be connected to Internet to enable this feature. Be aware that internet traffic will result if this feature is enabled, which can lead to internet cost.
Acess Sailmon over Internet
off
Enable NMEA0183 output on UDP Port 7000. This feature is used to send Sailmon data to Navigation software which support NMEA over UDP
NMEA0183 Output on UDP Port 7000
off
Enable Expedition output on UDP Port 5010. This feature enables to send Sailmon data to Expedition Tactical Software in high speed.
Expedition Output on UDP Port 5010
on
Enable Fastnet output on SBoxLP. This feature enables to send B&G Fastnet Data over the SBox Port2. To enable this feature the SBox Port2 must be switched to Fastnet with the Sailmon PC Tool. Never enable this option if you have a B&G processor on board
SBox Fastnet Output
on

Simulation: Only used for boatshow and demo purposes. Switch off whenever installed on a boat!

Access Sailmon over Internet: Sailmon Support can access your system over internet if this option is enabled and the SBox LP is connected to Internet. This allows remote maintenance, software update and calibration assistance. Of course Sailmon will never access your instruments without your knowledge!

NMEA0183 Output on UDP Port 7000: Sailmon can send the calibrated data to other devices or instruments over NMEA0183 over UDP if this option is enabled. Switch off to save network bandwidth if this option is not used!

Expedition Output on UDP Port 5010: Sailmon can send the calibrated data to Expedition tactical software in high speed if this option is enables. See the Sailmon-Expedition manual for more information.

SBox Fastnet Output: Sailmon can send the calibrated data to B&G devices like FFDs, GFDs, ACP1/2 and 20/20s, 30/30s and 40/40s. This feature is indented to be used by custom projects and needs proper planning. Contact Sailmon on how to use this feature. **Never enable this feature if a B&G processor is installed. This will corrupt data and can lead to dangerous navigation situations!**

Appendix B: Sailmon Wireless PC Data interfaces

SEND SAILMON DATA TO PC

Sailmon has a built-in server which generates NMEA0183 sentences from the most important values of the system and provides easy access to these values over the Wi-Fi network. This means you can connect your navigation or tactics software on your laptop or handheld PC to the Sailmon network with wireless communication.

See

APPENDIX B: SBOX LP NMEA0183 SENTENCES on page 89 for a list of provided NMEA0183 sentences.

The NMEA0183 sentences are generated in the server monitor and are broadcasted over UDP protocoll. The settings are:

UDP Port	7000

As soon as your computer is connected to the Sailmon network you are able to receive the NMEA0183 messages. For connecting your computer to the Sailmon wireless network see PC or laptop on page 63.

Sailmon data will be wirelessly sent over UDP with NMEA0183 format. This means, you can connect to any navigation or tactical software as soon this software provides NMEA0183 over IP.

Sailmon provides manuals for setting up wireless connections to Expedition, SeaTrack and MaxSea.

Tactical software can send tactical information like laylines, starline etc. to Sailmon port 7000. Use the B&G custom NMEA0183 sentences $PBGTLAY and $PBGTSR sentences:

$PBGTLAY,x.x,N,hhmmss*hh
x.x Distance to Layline in nm
hhmmss: Time to Layline

$PBGTSTR,x.x,M,hhmmss,X *hh
x.x Distance to Startline in nm
hhmmss: Time to Start

Also, the standard NMEA0183 waypoint sentences are accepted by Sailmon to display time and distance to mark. Data sent to port 7000 appear in the “Tactical” group of Sailmon data.

SEND RAW SBOX DATA TO PC

All NMEA data received by the Sailmon SBox (both port 1 and port2) can be transferred to a PC over wifi.

ONLY DATA FROM THE NMEA0183 PORTS WILL BE SENT IN THIS CASE.

SBox Port 1 NMEA0183 data	UDP Port 4002

SBox Port 2 NMEA0183 data	UDP Port 4001

NEXUS FDX SERVER INTERFACE

The Sailmon SBox allows direct communication with a Nexus FDX Server. In this mode, you can read and write to the Nexus server, while Nexus data are still available to Sailmon. See the Sailmon to Nexus interconntion manual for details.

If you want to directly communicate with Nexus, use the following settings:

Nexus direct interface	UDP Port 4004

The SBox must be in Nexus FDX mode to enable this feature. The Sailmon SBox provides an intelligent Nexus FDX wakeup sequence.

APPENDIX B: SBOX LP NMEA0183 SENTENCES

NMEA0183 input sentences (Port 1 & Port 2):

DBS	Depth Below Surface
DBT	Depth below transducer
DPT	Depth of Water
GLL	Geographic Position - Latitude/Longitude
GGA	Global Positioning System Fix Data
GSA	GPS DOP and active satellites
HDG	Heading - Deviation & Variation
HDM	Heading - Magnetic
HDT	Heading - True
HSC	Heading Steering Command
MDA	Meteorological Composite
MHU	Humidity
MMB	Barometer
MTA	Air Temperature
MTW	Mean Temperature of Water
MWD	Wind Direction & Speed
MWV	Wind Speed and Angle
OSD	Own Ship Data
RMA	Recommended Minimum Navigation Information
RMB	Recommended Minimum Navigation Information
RMC	Recommended Minimum Navigation Information
RMF	Position Information
RMZ	Altitude Information
ROT	Rate Of Turn
RSA	Rudder Sensor Angle
VBW	Dual Ground/Water Speed
VHW	Water speed and heading
VLW	Distance Traveled through Water
VPW	Speed - Measured Parallel to Wind
VTG	Track made good and Ground speed
VWR	Relative Wind Speed and Angle
VWT	True Wind Speed and Angle
XDR	Transducer Measurement
XTE	Cross-Track Error, Measured
ZDA	Time & Date - UTC, day, month, year and local time zone
ZLZ	Time of Day
ZTG	UTC & Time to Destination Waypoint

APPENDIX C: NMEA2000 SENTENCES

NMEA2000 input sentences:

PGN (hex)	PGN(dec)	Function
0x01E800	59392	ISO Acknowledgement
0x01EA00	59904	ISO Request
0x01EB00	60160	ISO Transfer Protocoll
0x01EC00	60416	ISO Connection Management
0x01EE00	60928	ISO Address Claim
0x01F010	126992	System Time
0x01F10D	127245	Rudder
0x01F112	127250	Vessel Heading
0x01F113	127251	Rate of Turn
0x01F119	127257	Attitude
0x01F11A	127258	Magnetic Variation
0x01F200	127488	Engine Parameters
0x01F205	127493	Transmission Parameters
0x01F20D	127501	Binary Switch Bank Status
0x01F20E	127502	Binary Switch Bank Control
0x01F211	127505	Fluid Level
0x01F214	127508	Battery Status
0x01F503	128259	Speed, Water referenced
0x01F50B	128267	Water Depth
0x01F801	129025	Position, Rapid update
0x01F802	129026	COG, SOG, Rapid update
0x01F803	129027	Position Delta, High Precision Rapid Update
0x01F804	129028	Altitude Delta, High Precision Rapid Update
0x01F809	129033	Time & Date
0x01F903	129283	Cross Track Error
0x01F90B	129291	Set & Drift, Rapid Update
0x01FA03	129539	GNSS DOPs
0x01FA0A	129546	GNSS RAIM Settings
0x01FA0E	129559	GNSS Differential Correction Receiver Interface
0x01FD02	130306	Wind Data
0x01FD06	130310	Environmental Parameters
0x01FD07	130311	Environmental Parameters
0x01FD08	130312	Temperature
0x01FD09	130313	Humidity
0x01FD0A	130314	Actual Pressure
0x01FD0B	130315	Set Pressure
0x01FE10	130576	Small Craft Status